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THE
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VOL. XXIII.

"The classifications of the naturalist define abruptly where Nature more or less blends. Our systems are nothing if not definite."—

Dr. Asa Gray.

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VOLUME XXIII.

NOTES ON BRITISH TORTRIES.

BY CHAS. G. BARRETT, F.E.S.

(Continued from Vol. xxi, p. 126.)

Adverting to my remarks (Vol. xxii, pp. 1, 2) on the closely allied and difficult species of *Dichrorampha*, Gn. (*Dicrorampha* and *Endopisa*, Wilkinson), I have, I think, after much consideration, arrived at some sort of a satisfactory conclusion.

Out of the eight species or varieties there enumerated, I think that four species may be reliably distinguished. One of these—the 6th—is our well-known *plumbagana*, about which there is no question, and which seems to require no remark now.

No. 5—our commonest species, found almost everywhere in grassy places—is heavily weighted with names. It is certainly *ulicana*, of Wilkinson and Stainton, and, I think, without doubt, *blepharana*, H.-S. (197, 8), and *plumbana* of Heinemann. *Zachana*, Treitschke, appears to be a rather more pointed-winged species, but its markings would do for this or either of its allies, yet *ulicana* of Guenée was confessedly substituted for it. In fact, Guenée gave no description of *ulicana* at all. Scopoli's *description* of his *plumbana* is quite useless; in fact, he mentions "ferruginous spots," of which this species presents no trace, but the name *plumbana* seems to have been restored to it by Zeller, who had an opportunity of examining the (very rare) *plates* belonging to Scopoli's work, and must have found in them the necessary evidence. Under this name of *plumbana* the species is now generally known, and it seems unnecessary to object to it. It certainly has the merit of suitability.

The species—No. 1—which we had been accustomed to call *tanaceti*, until Mr. Warren unravelled the history of that name, and showed it to belong to the comparatively northern species which I had called *herbosana*, appears to agree sufficiently well with Guenée's description of *saturnana*, to which Heinemann and Wocke also refer it.

Anterior-wings above olivaceous, irrorated with yellow scales, as in *ulicana*, especially at the apex. A very faint dorsal spot and leaden lines, not blue, of which

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the first bounds a triangular speculum, as in *plumbana*. Four black spots before the leaden cilia, and the costa distinctly streaked with leaden. Hind-wings grey, with concolorous cilia.

I now think that my specimens (No. 3) from the Isle of Wight and Hungerford, Wilts, are merely small specimens of this species (indeed, they agree in size better with Guenée's description than does our ordinary form), and that those from Galway (No. 7) are darker specimens of the same.

For the species (No. 2) formerly mixed with the last, but having a distinct costal fold, of which I recorded specimens from the coast of Pembrokeshire, and at Plymouth, and which seems to occur along the south coast, I think that we may safely adopt the name of *senectana*, Guenée, which has been so long, doubtfully, included in our lists. Guenée seems to have disregarded the costal fold, but otherwise his description is sufficiently accurate.

Allied to *ulicana*, but larger and paler. Anterior-wings of the form of *caliginosana (simpliciana)*, hoary grey, irrorated entirely with very numerous yellow scales, almost immaculate. A dorsal spot and marginal dots scarcely perceptible. Costa streaked with leaden. Cilia leaden, separated by a white line, as in *caliginosana*, and furnished with a little apical tooth. Hind-wings grey. Under-side of all the wings hoary, silky, with a greenish gloss.

To this it only seems necessary to add, "Costa folded in the male." To this species I think that my rather smaller specimens (No. 4) from Teignmouth and Darlington belong, and also the single specimen from Zeller (having Heinemann's label), which has the costal fold. The other two (No. 8) must be *saturnana*, Gn. Though yellower than our specimens, there is nothing to separate them specifically. Neither is there any very apparent distinction between *saturnana* and *senectana*, until under a magnifier the fold becomes visible. The folded costa produces a slight difference in shape, which is evidently referred to by Guenée when he writes, "Anterior-wings of the form of *caliginosana*"—a folded species. Heinemann includes *plumbana* and *saturnana* in his section of the genus *Dichrorampha*, which is without the fold.

When recently looking through Dr. Mason's magnificent collections at Burton-on-Trent, I found in his series of *Sericoris alternana (Daleana)*, from Scotland, specimens deviating from the usual unicolorous type, in the direction of showing darker fasciæ across the anterior-wings, and others in which these markings were sharply and distinctly defined, agreeing exactly with types of *metallicana*, Hüb., formerly sent me by Professor Zeller.

The gradations in different specimens are so regular as to prove, in my opinion, beyond doubt, that our insect is only a local form of the widely distributed mountain-frequenting *metallicana*. This well-marked form is rather pretty, the markings, which are brownish-grey, consisting of a large basal blotch with sinuated margin, a central fascia with straight margins and nearly of a triangular shape, and another fascia in the form of a slender triangle across the apex. Hübner's figure 68 is sufficiently accurate, and was published thirty years before Curtis's name *alternana*—if even he had correctly described the species,—and Hübner's name, *metallicana*, must evidently be adopted for our insect. As already noted (Ent. Mo. Mag., vol. xi, p. 59), the name *Daleana*, still so commonly used in our collections, has really no foundation at all.

Antithesia fuligana, Hüb., *ustulana*, Haw.—When the specimens formerly noticed (vol. ix, p. 129) were reared from stems of *Stachys palustris* from Wicken Fen, the idea suggested itself that, from their shape, they must be distinct from the form found among *Stachys sylvatica* at the edges of woods and elsewhere in the south of England; but this view, in deference, I think, to the opinion of my friend Mr. Doubleday, was at that time suppressed. It has asserted itself from time to time since, and lately has been strongly urged upon me by Mr. Warren, who had personal acquaintance with the form found in the fens, and was much struck by the difference in shape of the fore-wings when he saw a fine series of the other taken in the London district. Still more recently, when engaged in examination of the structure of the genital sheaths of the males, I found conclusive structural evidence of their distinctness, and even of their belonging in this respect to different *groups* in the genus *Antithesia*.

Thus it has become necessary to ascertain to which of these species the name *fuligana* really belongs, and with the help of my kind friend Mr. Stainton, and his valuable library, I think I have worked this question out.

Hübner's figure 109 (*fuligana*) is clearly a rather large representation of our *southern* species (from *Stachys sylvatica*), as also is Herrich-Schäffer's figure under the same name, and for this species the name must be retained. *Ustulana*, Haw., is certainly the same species. He describes it:—

Anterior-wings *obtuse*, obscure smoky, with base broadly black or deep black, *scorched*, with large, straight, obscure middle fascia, extreme hind-margin and cilia *scorched* black. Costa with two beautiful orange spots. Between the middle fascia

and the hind-margin, a faint square spot near the margin, and another at the anal angle, both grey, only visible in certain lights. Hind-wings and all the cilia, black.

The "scorched" appearance is produced by a delicate marbling of chestnut scales, and is very characteristic of this species, as distinguished from that found among *Stachys palustris*.

Wood's figure of *ustulana* (912) is more of the *shape* of the latter, but has a distinct round black spot in the sub-apical pale band, which does not belong to either, and seems to render it unrecognisable.

Under these circumstances, I think it will prevent confusion if we adopt the name *carbonana* of Doubleday's list for the fen species. This name is not, as far as I know, supported by any figure or description, but it has been very generally used in connection with these (combined) species, and may very well (and extremely suitably) be adopted for that now recognised and separated for, I believe, the first time. It may be described as follows:—

Carbonana (Dbld. list). Head black. Palpi and antennæ hoary grey, thorax dark grey, fore-wings rather narrow, with costal margin but little arched, and the hinder portion of the wing somewhat squared. Ground colour varying from very smoky whitish to blue-grey, basal blotch large, blackish, with indented, somewhat perpendicular, margin; central fascia rather narrow, perpendicular, deep black with the margins indented and irregular, often cloudy; just beyond and parallel with it is an elongated black blotch, and another merging into an obscure triangle on the anal angle; hind-margin and apex irregularly streaked with black; on the costa a few irregular black dots, from which run delicate lines into the paler space. Cilia dark grey, with a black line at their base. Hind-wings dark grey, cilia paler.

Among *Stachys palustris* in fens and marshes in June, the larva feeding in the stems in the autumn.

It is a very obscure smoky-looking species, distinguished from *fuligana* by its longer, more sharply squared, fore-wings, and the absence of the "scorched" markings; and from *marginana*, which it nearly approaches in shape and size, by its dark ground colour and ill-defined smoky markings, which also are differently placed, and by the dark hind-wings in both sexes.

London: May 12th, 1886.

NOTES ON THE OVA AND LARVÆ OF *BANKIA ARGENTULA*.

BY JOHN BROWN.

Chippenham Fen, Cambridgeshire, is one of our best localities for *B. argentula*; it occurs abundantly there the whole of the month of June. The date of my visit to this place was upon the 10th of June, 1884, for this species in particular, great numbers of which were taken

not only by myself but by other entomologists who were there ; many of my captured specimens deposited numerous ova in confinement, and it happened these were nearly all fertile and were reared through all stages without difficulty, appearing in perfect condition in the early part of June, 1885. In July, 1884, when these larvæ were approaching maturity I thought I would visit Chippenham Fen, hoping I might succeed in finding them upon their food-plants, and was not there very long before I found many larvæ full grown by shaking the high grass-stems into a little pointed frame covered with a thin white cloth ; nearly all these changed to pupæ and came out perfect specimens at the same date as those bred from ova, June, 1885.

Description of ova.—The ova were deposited in single lines, being attached to each other, the first and last eggs were secured by claspers ; form, oval ; colour, pale yellow, transparent, and under high power perfectly smooth.

Larvæ.—When first hatched (7 days) they were little wriggling grey larvæ, and immediately commenced feeding upon under-side and parenchyma of the food plant ; when touched or disturbed they fell suspended by threads in a manner peculiar to loopers ; after the first moulting they assumed a green tint. In about three weeks, when full grown, these half-looper larvæ became pale green ; head darker ; a drab line down centre of back, a pale yellow line running parallel, and another line parallel not so distinct ; the segments divided by horizontal lines of pale yellow accompanied by other lines but faintly marked. Length, $\frac{1}{2}$ -inch or 9 lines.

Food plants.—*Poa annua, aquatica, pratensis*, and other grasses. Larva goes to earth for transformation, pupa being enclosed in a silken cocoon.

5, King's Parade, Cambridge :
April 6th, 1886.

NOTES ON THE VARIATION OF *LEPIDOPTERA* TAKEN NEAR DERBY.

BY JOHN HILL.

As I meet with varieties of some of the common *Lepidoptera* which do not appear to be general, perhaps a few notes on the different species occurring in this neighbourhood which vary, may be of interest to the readers of the Ent. Mo. Mag.

We are very poorly represented in butterflies, my own captures in the immediate neighbourhood (including *Colias Edusa*, which occurred pretty freely in 1877) amount to only eleven species ; but the district is very prolific in moths, many of which are scarce.

Chrysophanus Phæas.—I took one of the colourless variety in 1877, which I believe is in the collection of the late Rev. H. A. Stowell ; the spots on the fore-wings of this insect vary in size.

Smerinthus populi.—I have a specimen with the russet spot on the under-wings wanting : also one of the brown variety with a lovely lilac bloom on the wings, bred this season ; I only hope the bloom will last.

Hepialus hectus.—One with the silvery markings continued on the hind-wings. *H. vellea*.—This abundant insect is very variable. I have met with it of all shades, from the ordinary type to brown, with the lighter markings scarcely perceptible, and only a small white spot on the fore-wings (*v. carnis*).

Bombyx quercus.—Variety *calluna* is common.

Odontoptera bidentata.—I often meet with very dark specimens of the male.

Crocallis elinguaria.—The band across the fore-wing of this insect varies very much in colour.

Phigalia pilosaria.—The markings on this insect vary very much, from that with the lines across the wings very distinct, to a sort of an olive colour without any markings. I have a specimen which has the wings very nearly black, with a narrow grey border on the hind margins.

Amphidasya betularia.—I have bred the black variety freely, and also intermediate varieties.

Boarmia repandata.—This varies very much; I have never met with the dark-banded form, but have a specimen of a sort of orange-brown colour without any of the lighter markings.

Tephrosia biundularia.—This is one of the most variable insects I meet with; it varies in all shades of colour, from the usual light type to nearly black, the ordinary form being the rarest; sometimes the darker forms will have a patch of the light grey colour on the hind-wings, and usually more on one wing than the other, generally the left hind-wing. My experience of this insect is that it is getting gradually darker year by year, especially in one of the woods. *T. punctulata*.—I have met with a nice dark banded form of this insect.

Ephyra punctaria.—I have one with the brown line across the wings very broad.

Eupisteria separata.—This occurs from the ordinary colour to nearly black.

Fidonia piniaria.—I get both the northern and southern forms of the male, that is, both white and yellow ground colour, and the females varying from a bright yellow to brown and a dark smoky colour.

Hibernia progemmaria.—This varies to a very dark form.

Eupithecia lariciata.—I have a variety of this "pug" of quite a pale grey with a darker band round the hind margins of all the wings.

Thera variata.—I have bred some dark banded forms of this insect, but not so dark as some of the Scotch varieties.

Hypsipetes impluviata.—This insect varies from a light to very dark form. *H. elutata*.—This varies to rusty-brown and very dark brown.

Cidaria pyraliata.—I have met with some dark varieties of this insect.

Cymatophora duplaris.—Specimens of a very dark smoky-grey occur.

Bryophila perla.—Sometimes an ochreous form of this insect occurs, and also a dark variety.

Xylophasia rurea.—I have met with the light, dark, and an intermediate form of this common insect. *X. polyodon*.—Nearly every season I meet with dark varieties of this insect, almost as dark as the Scotch forms, but they are very rare.

Noctua festiva.—I have bred specimens of this insect that I really cannot dis-

tinguish from some specimens I have had sent me from Scotland under the name of *confusa*, either as regards size or colour. *N. baja*.—I bred some splendid varieties of this insect last season.

Tanioecampa rubricosa.—This varies from a very pale to a very dark form. *T. populeti*.—I met with a dark form of this insect. It is not an uncommon species in this district, its larva feeding between leaves of poplar.

Xanthia cerago.—I have bred this insect freely, and have a series in which the dark markings gradually disappear until they reach the variety *flavescens*.

Miselia oxyacantha.—The dark variety is of frequent occurrence.

From the foregoing list I have omitted some that vary, but not to the extent of those noticed.

Whittaker Lane, Little Eaton, near Derby :

April 19th, 1886.

DESCRIPTION OF THE LARVA OF *CRAMBUS PERLELLUS*.

BY G. T. PORRITT, F.L.S.

In July, 1884, Mr. Nelson M. Richardson sent me a supply of eggs of *Crambus perlellus*, obtained from a moth or moths he had taken in the neighbourhood of Llangennech, Carmarthenshire. They hatched in the third week of the same month, the newly emerged larvæ being yellowish-green, with a red longitudinal vessel or stripe showing through the skin, which gave them a salmon-coloured appearance; head and frontal plate dark brown, indeed almost black.

They were placed in a pot in which were growing one or more of the common garden lawn grasses, and on which they at once made themselves perfectly content.

On examining them on September 8th, I found they were living in silken galleries spun at the bottom of the grass stems, and were about one-third of an inch long. Four days later, on the 12th, I saw them again, when they were still only about the same length. The ground-colour varied from dingy olive-brown to dirty purplish-brown, the skin in all cases being so transparent that the internal alimentary vessel could be distinctly traced through it: the head varied from pale brown with darker marks to very dark sienna-brown; the frontal plate to some extent followed the colour of the head, but without the darker markings, and in the olive tinted specimens was paler and greener.

From this time they evidently hibernated, and I do not know at what date they recommenced feeding in the spring. By April 25th they were about three-eighths of an inch long, and of the usual *Crambus* form. Ground colour light mahogany-brown, the tubercles darker brown with a black dot in each; frontal plate almost unicolorous with the ground colour; head very dark sienna-brown throughout. They were living in galleries formed of particles of grass woven together with silk,

and placed upright against the stems of grass, but resting on the ground at the base, their habit of living and feeding, indeed, being exactly like those of *Crambus Warringtonellus* as described by Buckler in the Ent. Mo. Mag. of November, 1880, p. 130. By June 1st they had reached half to five-eighths of an inch, and were still of the pale mahogany tint; the hind pair of tubercles on each segment had become much narrower than the front pair; the front pair were nearly round though slightly oblong, whereas the hind pair took almost the form of transverse streaks. At this time most of the larvae appeared to be about moulting, and there was evident indication that with it would be a change of colour, for a greyish tint clearly showed through. By June 17th they were evidently full-grown, and were described as follows:—Length, three-quarters of an inch, stout, and of the usual *Crambus* shape, i.e., cylindrical, of nearly uniform width, tapering slightly at the posterior segments; skin semi-transparent, the head, plates, and raised tubercles, polished; the front dorsal pair of tubercles on each segment, and those on the sides, round, the hind dorsal pairs narrow and almost oblong; segments well defined, and each having a sub-dividing transverse wrinkle in the middle.

The ground is of a greyish-stone colour, some specimens having a brownish tinge; head usually pale yellowish-brown slightly freckled with darker brown; but in occasional specimens it is much darker brown; in all cases the mandibles are dark sienna-brown; frontal plate of a slightly browner shade than the ground colour. The greenish alimentary canal shows through as the dorsal stripe; tubercles of a darker shade of the ground colour, each contains a black spot from which springs a single short hair; spiracles intensely black. Ventral surface of a paler shade than the dorsal area; anterior legs ringed and tipped, and the posterior legs slightly fringed with dark sienna-brown.

All through they fed and lived in precisely the same manner as does the larva of *C. Warringtonellus*. The first two imagos appeared on July 25th, and the others continued to appear until about the middle of August, by which time I had bred a nice series. Every specimen was of the pale-bronze veined form, and all were, as far as I could judge, exactly intermediate between the ordinary white form of *perlellus* and *Warringtonellus*; so much so, indeed, that I was puzzled to which species they belonged; and the more so, as on submitting some of them to Mr. Richardson, he was uncertain as to whether he had ever taken the white form on the ground where he had captured the parent of my specimens. On submitting some of them to Mr. Stainton, however, he referred them to *perlellus*.

From the foregoing description it will be found that the larva of *perlellus* agrees closely with that of *Warringtonellus*, and the rearing of it has not in any way shaken the opinion I have long held, that the latter is nothing more than a form of the former.

Huddersfield: May 12th, 1886.

TROPICAL AFRICAN COLEOPTERA; CHIEFLY FROM THE
ZANZIBAR MAINLAND.

BY H. W. BATES, F.R.S., &c.

(Continued from Vol. xxii, p. 197).

CRASPEDOPHORUS DEFLEXUS, sp. n.—*Mediocriter convexus, niger, breviter setosus, palpis antennis tibiis et tarsis rufo-piceis, elytris utrinque maculis duabus rufis, interstitia 5—8 tegentibus, 1^{ma} a basi sat distanti, quadrata: capite lato collo haud depresso, toto grosse punctato, oculis valde prominentibus: thorace latissimo, lateribus regulariter ab apice usque ad basin arcuatis sed versus apicem magis convergentibus, margine late explanato, nec reflexo, postice deflexo, angulis posticis denticulo acuto, toto grosse discrete punctato: elytris profunde punctato-striatis, interstitiis minus dense et grossius punctulatis.*

Long. 17 mm.

Mount Cameroons; one example.

The form of the thorax is unlike that of any other species known to me. It approaches nearest *C. festivus* (Klug), but is much broader and less narrowed in front; the side margins are more broadly flattened even from the anterior angles, at first plane and behind deflexed, with a corresponding convexity of the dorsal surface towards the hind angles. The elytra are oblong-ovate, narrower at the base than the thorax at its widest part. The metathoracic episterna are scarcely broader than long, and the ventral segments are crenulated on their front margin. The apical joints of the palpi are not remarkably elongated at their exterior apex.

CRASPEDOPHORUS ABNORMIS, sp. n.—*Elongato-oblongus, mediocriter convexus, breviter setosus, niger, elytris utrinque maculis tribus flavis, prima humerali apud interstitium 8^{um}, secunda antemediana interstitia 4—6, tertiaque sub-apicali interstitia 4—8 tegentibus: capite parvo, collo constricto, oculis valde prominentibus, sulcis frontibus duobus profundis interspatiisque valde convexo vertice sparsim punctato: thorace fere sicut in *C. brevicollis* (Dej.), sed lateribus antice latius rotundatis, transverso, lateribus arcuatis, angulis anticis late rotundatis, confertim grossissime punctato: elytris relative valde elongatis, oblongis, profunde punctato-striatis, stria 3^{ia} apud maculam medianam flexuosa, interstitiis sat crebre punctatis.*

Long. 21 mm.

Mpwapwa (Mr. Last); two examples, ♀?.

Unlike any other species, both in form and markings. Although the terminal joint of the palpi is simply obliquely triangular (♀?) it consorts better with the *Craspedophori*, in which that joint is greatly prolonged at its outer angle, than with the *Epicosmi*. The labrum has its front edge broadly emarginated: the antennæ are long, with the joints 4—9 much dilated and compressed. The metathoracic episterna are very long, and the ventral segments crenulated on their anterior

margins. The anterior tarsi are simple. The median yellow spot of the elytra is sub-triangular, the inner portion of it (that which lies on the 3rd interstice) being longer than the two others; the sub-apical spot is flexuous and narrow.

EPIGRAPHUS INSOLITUS, sp. n.—*Brevis et latus, niger, nitidus, dense brevissime setosus, palpis antennis pedibusque rufotestaceis elytrisque utrinque maculis duabus rufis, 1^{ma} a basi sat distanti interstitia 6—9 vel 5—8 tegenti, 2nda versus apicem sub-rotundata interstitia 4—8 tegenti: capite sicut in E. arcuaticollis lato omnino punctato; thorace valde transverso, mox ab angulis anticis late rotundato, post medium lateribus sinuatis, angulis posticis valde prolongatis acutis, basi bisinuato, creberrime punctato; elytris punctato-striatis intersticiis creberrime punctulatis apice sinuatis.* Long. 12 mm.

Mount Cameroons; two examples, males.

This is the third species described of this remarkable genus, in which the males have four joints of the anterior tarsi moderately dilated, triangular or cordiform, and furnished on their soles with a brush of longish fine hairs; the sole example of such a structure in the section to which the *Panagaeidae* belong. In size the species resembles *E. amplicollis* (Schaum), of Natal, from which it differs *inter alia* in its pale reddish-testaceous legs and antennæ.

Sub-fam. *CHLÆNIINÆ*.

CHLÆNIUS MAMBOIANUS, sp. n.—*C. signato, Boh. (apiato, Klug) proxime affinis et simillimus: multo major, suprâ toto fusco-cupreus, opacus, elytris macula parva discoidali (longe post medium) apiceque ipso, flavis; antennis valde elongatis et robustis nigris, articulo primo flavo, pedibus flavo-testaceis, genubus tibiis posticis intus tarsisque omnibus fuscis.*

Long. 14—17 mm., ♂ ♀.

Mamboia (Mr. Last); many examples.

Belongs to the same group as *C. signatus* (Boh.), and similar to that species in general form and colours. But it is much larger and more robust, the antennæ especially longer and stouter, reaching to the middle of the elytra, and thickened after the third joint. The palpi are reddish-piceous, long and stout, the apical joint of the labials much broader and more truncated at the apex than in *C. signatus*. The colour above is dark coppery-brown, opaque, the margins of the head, thorax and elytra more or less brassy-green. The head and thorax are densely confluent-punctulate, as if minutely corroded, the elytra sharply punctulate-striate, with the interstices closely granulated. There is no trace of the yellow lateral vitta characteristic of *C. signatus*, but the small yellow spots on the posterior part of the disc are larger

and united into a V-shaped spot, covering interstices 4—6, with a smaller detached spot on the 3rd; the apical (sutural) yellow spot is as in *C. signatus*.

CHLENIUS EURYSCOPUS, sp. n.—*C. spoliato affinis sed multo latior elytrisque maculatis. Brevior, glabratus, viridi-aneus elytris nigris, margine fascia mediana apiceque late flavo-testaceis; oculis valde prominentibus; thorace relative parvo breviter cordato, alutaceo vix punctato: elytris latissimis humeris late rotundatis, valde striatis, striis haud perspicue punctatis, interstitiis impunctatis: corpore subtus nigro fere laevi, abdomine margine late pedibus palpis et antennis flavo-testaceis.* Long. 14 mm., ♀.

Akele, Gaboon.

Belongs to the *spoliatus* sub-group of the genus; the thorax being nearly impunctate, as is also the prosternum, which shows only a few faint punctures in the middle of the episterna. The junction of the marginal with the basal fold of the elytra forms a distinct but obtuse angle, and the shoulders from the angle are very broadly rounded. The thorax is broader than long, with sides strongly rounded anteriorly, and equally strongly sinuate-angustate towards the base, straightening to form rectangular almost acute hind angles. The yellow border of the elytra extends to the 6th stria from the shoulder (where it is still further dilated) to the median fascia, which reaches the 2nd stria; between the fascia and the broad apical spot it reaches no further than the 8th stria. The disc of the head and thorax is of a rich purple-coppery hue.

CHLENIUS LASTII, sp. n.—*Species insolita, capite parvo collo crasso, palpis (labialibus) securiformibus elytrisque interstitiis 3^{io} 5^{to} et 7^{mo} angustis carinatis. Magnus, supra cæruleo-violaceus opacus, capite (postice) thoraceque grosse confluenter punctatis, elytris confertim subtiliter punctulatis; palpis labro (apice recto) antennis et pedibus pallide rufis.* Long. 25 mm., ♀.

Mpwapwa, East Central Africa (*Mr. Last*).

This singular species approaches nearest *C. violaceipennis* (Chaud.), having a similarly formed, though smaller, head, and similarly securiform labial palpi; but instead of being nearly smooth like that species, it is above densely sculptured, most coarsely on the hind part of the head and the entire surface of the thorax. The latter is rather narrow and elongate, the sides only slightly rounded, scarcely narrowed behind, and little more so towards the front angles, which closely embrace the sides of the broad neck. The antennæ are slender, the 3rd joint nearly twice as long as the 4th. The 3rd, 5th and 7th elytral interstices are cariniform, with the summit of the ridges smooth or nearly so, all

the rest of the surface is densely and finely punctured ; the other interstices are moderately convex. The sides of the pro- and meta-sternum are strongly and rather closely punctured ; the sides of the meso-sternum and abdomen less densely punctured.

CHLÆNIUS SWAHILIUS, sp. n.—*Valde elongatus, nigerrimus sub-nitidus, capite (media fronte excepta) thoraceque grossissime vix confluentem punctatis; elytris profunde punctulato-striatis interstitiis convexis sparsim punctatis: oculis vix prominentibus collo gradatim angustato; antennis valde elongatis, robustis; palpis apice late truncatis; thorace elongato antice sat late rotundato postice gradatim angustato, angulis obtusis, margine prope basin sat reflexo fovea utrinque basali elongato profundo.* *Long. 28 mm., ♀.*

Mpwapwa, East Central Africa (*Mr. Last*).

In its structural characters this large and handsome *Chlænius* is intermediate between *C. violaceipennis* and *C. lugens*, but does not fit any of the sub-sections of Chaudoir's Monograph. The sides of the abdomen are irregularly and somewhat sparsely punctured, and there are a few fine punctures in the middle. The metathoracic episterna are not longer than broad, and are coarsely confluent-punctate, the sides of the pronotum being uniformly but remotely punctured. The thorax is relatively large, and its anterior part is as broad as the basal part of the elytra ; the marginal fold of the latter forms an acute angle at the shoulders.

CHLÆNIUS MAKALOLO, sp. n.—*Elongatus, niger caruleo-tinctus, capite (postice) thorace grossissime confluentem, elytrisque subtiliter punctatis: capite post oculos gradatim angustato; palpis apice haud dilatatis truncatis; labro antice recto: thorace sub-quadrato lateribus mediocriter et prope medium rotundatis angulis posticis sub-rectis: elytris profunde punctulato-striatis, interstitiis convexis alternatim sub-lævibus et crebre punctulatis.*

Long. 26 mm., ♂ ♀.

Mozambique ; Zambesi.

Closely allied to *C. swahilius* and belonging to the same group, but of different facies, owing to the form of the thorax—more quadrate, with sides only very slightly rounded at about the middle. The elytra are very much more finely and closely punctured and less shining, but the punctures are less numerous on the interstices 1, 3, 5 and 7 than on the alternate ones. The metathoracic episterna are quite as short as in *C. swahilius*, but less closely punctured.

CHLÆNIUS SCULPTILIS, sp. n.—*C. carbonario (Dej.) similis sed paulo longior, palpis minus dilatatis abdomineque medio sparsim punctulato-pubescenti. Elongato-oblongus, niger sub-opacus, capite postice thoraceque confertim*

sub-confluenter haud grosse punctatis: palpis labialibus & mediocriter dilatatis truncatis; antennis validis, compressis; thorace elongato versus apicem parum versus basin haud angustato, lateribus vix rotundatis, intra marginem a basi usque ad apicem depresso vel sulcatis, soeveaque utrinque elongata: elytris basi lato, angulo humerali acuto sub-dentato, profunde striatis vel sulcatis sulcis fundo crenato-punctatis, interstitiis omnibus convexis aequaliter haud subtiliter punctatis.

Long. 18 mm., ♂.

Mamboia, East Central Africa (*Mr. Last*).

Similar in its elongate-oblong parallel-sided form and uniform black colour to *C. carbonarius*; also not unlike the species of the South African group to which *C. piceus*, &c., belong: but differs from all in the very evident though sparse punctuation of the middle part of the abdomen, which character would place the species in a different division, according to Chaudoir's classification. The sides of the pronotum, the metathoracic episterna and sides of the abdomen are covered with large but well separated punctures.

(*To be continued.*)

Heydenia auromaculata in Shetland, a species new to Britain.—When looking over Dr. Mason's collection at Burton-on-Trent, he showed me some specimens of a small moth which he had received under the name of *Ecophora flavimaculella*, but which he thought distinct. Being decidedly of the same opinion, I took an early opportunity of comparing it with Continental species in Mr. Stainton's collection, when it became at once evident that it was *Heydenia auromaculata*, Frey, a species hitherto only known to occur in the Alps, southern and eastern Switzerland, and in Norway.

Dr. Mason's specimens were taken in Shetland by (I believe) Mr. McArthur, and I understand that specimens have been distributed into other collections under the name of *Ecophora flavimaculella*, to which this novelty is nearly allied—both being placed by Hofmann in the genus *Heydenia*, with other seed-feeders. This is a pretty species, larger than *flavimaculella*, and having, in addition to the two yellow spots on the fore-wings as in that species, three more, one at the base and the other two above that which is on the inner margin, so that the three form a twice divided fascia across the wing. The outer spot nearer the apex is also much larger than in *flavimaculella*. Its larva in all probability feeds in the seeds of some umbelliferous plant, like its allies, but does not seem to be known.—CHAS. G. BARRETT, 68, Camberwell Grove, S.E.: *May 14th, 1886.*

Note on Antispila Pfeifferella.—During a short stay at Freshwater, Isle of Wight, in July last, I found the larva of this species in the greatest profusion in one of the many old fashioned lanes, with hedges six or eight feet high, that lead from Farringford to Totland Bay. There were only two good sized bushes of *Cornus sanguinea*, but nearly every leaf was mined by one or two larvae; wanting the species badly myself as also for my friends, I collected a good supply; also, I had long

wished to verify a statement by Mr. C. Healy, in the *Entomologist*, vol. ii, p. 129, and again mentioned in the *Nat. Hist. Tineina*, vol. xi, p. 310, which has always seemed rather puzzling to me, viz.: that the larvæ when full fed cut out their oval cases, descend to the ground, and convey their cases under the surface of the earth, and there change to the pupa state. This habit in a larva which is apodal appeared to me most extraordinary, and to test it I placed all the leaves I had in several glass jars with open tops like ordinary tumblers, with some fine earth at the bottom taken from the hedge where I obtained the larvæ, I then buried all the jars half down in a box of earth so that no light should get to the sides and left them for three months. I then very carefully examined the sides of the glass jars, but could not detect a single case below the surface of the earth. I then carefully took out the layers of leaves in all the jars, and found the cases were all concealed between the decaying leaves in exactly the same way as with its congener *Treitschkiella*. In some instances there were as many as twenty cases all close together in one patch. After carefully taking all the leaves out of each jar, I found numbers of cases on the surface of the earth, I then removed all these cases from the surface, and turned the earth out of each jar on to a sheet of paper, but with all my careful searching I did not find in any of the jars a single case that was beneath the surface, so that I am quite convinced there must have been some error in Mr. Healy's observations, or that the jam-pots which he generally used must have been shaken by some one unknown to him, so that the cases became mixed with the earth. He also says the species is very difficult to breed, which, again, is different to my experience, for by forcing in a temperature between 60° and 70° I have, during last month and the early part of this, had them emerging most freely.—GEO. ELISHA, 122, Shepherdess Walk, City Road, N.: April 19th, 1886.

Cosmopteryx Scribaella bred freely at Stettin.—We have now at Stettin all the known European species of the genus *Cosmopteryx*, since in the autumn of 1885 we found there the larvæ of *Scribaella*, and in far greater plenty than those of *Lienigiella*, for in spite of the most careful search we found scarcely more than 30 of the last named species, whereas of *Scribaella* we collected *several hundred* larvæ. These we found in individual plants of reed (*Arundo phragmites*), which grew in sheltered situations under young fir-trees (*Pinus sylvestris*) at the edge of a nearly dry ditch in a sandy locality; on some plants there were as many as 50 mines! The larva winters head downwards in the lowermost part of the mine, which here tapers to merely the breadth of the larva; this slender portion of the mine is from 15 to 20 mm. long, but sometimes has even a length of 60 to 80 mm. A mine of *Lienigiella* which I found at the same time was perceptibly broader, but shorter than those of *Scribaella*. Besides, the larva of *Lienigiella* does not pass the winter at the narrow lower end of its mine, but nearer the middle of the mine, where it has a breadth of more than 10 mm. One can besides readily distinguish the two larvæ, if we compare them whilst they are feeding in fresh green leaves of the reed. The figure of the larva of *Lienigiella*, given in Stainton's "Natural History of the Tineina," vol. xii, Pl. i, fig. 1, is a very good representation of that larva. The larva of *Scribaella* has an average length of $3\frac{1}{2}$ mm., and is smaller than the larva of *Lienigiella*; it is *greenish-white*, without markings, only the dorsal vessel is pale brown; the head is rather darker, but yet of a pale brown, with only the margins darker. The mark on

the second segment is similar to that shown in the figure of the larva of *Lienigiella*, only not quite so dark. The anal segment bears a yellow-brown plate, but in many of the larvae which I examined this segment only bore the same colour as the rest of the body, nor could I perceive any distinction when examining it with a lens. I bred my first specimen in an unwarmed room, on the 5th of April, and they still continue to come out daily.

As I am anxious to obtain correspondents among the more eager Micro-Lepidopterists in your country, I may mention, that I have surplus specimens of *Cosmopteryx Scribaella*, *Ornix petiolella*, *Laverna vanella*, *Stagmatophora Heydeniella* and *albiapicella*, *Lithocletis Staintoniella*, and sundry others of that genus, *Elachista pomerana*, *Agdistis tamaricis*, and many others. On the other hand I should be very thankful for specimens of *Agdistis Bennetii*, *Oxyptilus teucris*, *Goniodoma limoniella*, *Elachista kilmunella*, and other special English species.—

E. HEEING, Hauptmann, Rastatt, in Baden, Germany : April 22nd, 1886.

[The occurrence of *Cosmopteryx Scribaella* so far North as Stettin (and even in plenty there) is of special interest. The insect was first detected at Vienna, and has since occurred at Bremgarten, in Switzerland, where the larva was discovered in the leaves of *Arundo phragmites*, on the banks of the Reuss. Very probably it will yet be found in some of the Southern counties of England.—H. T. S.].

Trifurcula pallidella and *Genista tinctoria*.—I took my specimen of *T. pallidella* (cf. Ent. Mo. Mag., vol. xvi, p. 186) among *Genista tinctoria*, of which there was only a very little in a small plantation which, thanks (for once) to game-preserving, is not likely to be ploughed up. The plant grows sparingly in the next field, which has a north aspect and few insects occur there.

Pallidella seems to be on the alert from 7 to 9 a.m. ; perhaps we have a knack of missing many species which fly at that time of day. *Cecophora grandis* I know likes the morning sun.—J. B. HODGKINSON, 6, Fishergate Hill, Preston : March 31st, 1886.

On the synonymy of some species of Nyctemera.—*Nyctemera annulata*, Boisd., Dbd. (nec Walk.) ; *N. Doubledayi*, Walk. This species has been generally confused with the following, from which it is easily and at once separated by the wholly black cilia ; there are other minor differences, and the larvae of the two species are also quite dissimilar ; this species is liable to have the white markings greatly reduced or even wholly absent, which is never the case in the following. Boisduval's figure is admirable and unmistakeable, the only fault being that the yellow lines of the thorax (which was perhaps defaced) are not represented, but no similar species with a wholly black thorax is known to me. Boisduval's type was from New Guinea ; I have only seen the species from New Zealand, where it is generally abundant.

Nyctemera amica, White ; *N. annulata*, Walk. White's name must now be adopted for this species, in which the terminal half of the cilia is sharply yellowish-white ; it is confined, so far as I know, to Southern and Eastern Australia.

Nyctemera tertiana, sp. n. I propose this name for the species described and figured by Snellen (Tijd. v. Ent., 1878, 72, pl. vi, 6) as *N. latistriga*, Walk., which it is not ; believing it to be sufficiently distinct from *N. lacticinia*, Cr. The species

HABITS IN NORTH EAST AUSTRALIA AND CELEBES; IT VARIES IN HAVING THE INNER MARGIN OF THE HIND WINGS ~~COMMITTUM~~ ~~very~~ BROADLY SUFFUSED WITH BLACKISH, SO THAT THE WHITE COLOR IS REDUCED TO A DISCRETE SPOT; THIS IS CERTAINLY A VARIETY ONLY.—E. MEYRICK,
THE KING'S MUSEUM, PARRAMATTA, N.S.W.: April 3rd, 1886.

THE TWO SPECIES OF *Histeridae* AT PRESENT NOT INCLUDED IN OUR BRITISH LIST.—
Gnathocerus punctulatus, Thomson. Among some Coleoptera supposed to have been taken by the Rev. A. Matthews, some years ago, in Oxfordshire, I found three specimens, which have been forwarded by Mr. Lewis to Herr J. Schmidt of Gollwitz, and have been published by him as being (as far as regards two of them) *Gnathocerus punctulatus* of Thomson, without any doubt or comment. It will be remembered (as Dr. Murray has pointed out to me) that this species was recorded as *Hister* by Mr. Urquhart (Trans. Ent. Soc. Lond., 1867, p. 445; Ent. Ann., 1867, p. 70), but that Mr. H. H. Fairmaire subsequently saw reason for doubting its specific difference from *G. punctulatus*. Certainly upon the two specimens taken by Mr. Matthews the idea of their being identical with *G. punctulatus* did not even occur to me.

THE THIRD SPECIMEN Herr Schmidt returns as *Seprius pector*, Er., but remarks "THIS CANNOT BE *Hister*." This specimen is superficially very like the *Gnathocerus*, the most evident distinction being the generic one, viz., that in *Gnathocerus* the punctation in flight has its marginal striae suddenly converging, thus being lanceolate, while in *Seprius* the same lines gradually meet, so that the ridge of the punctation is pointed. This insect appears from the Munich Catalogue, to inhabit Africa and its territories, but will certainly require re-examination. *Gnathocerus* is a great collector and visits dried houses and places such as attics where owls breed, &c. It would indeed be well if any one has the opportunity of visiting such places, to take a few specimens, &c. in case of having more than one species of *Histeridae* in the collection. Herr J. Schmidt, Stuttgart: May 19th, 1886.

"I WALKED ON THE COASTAL PLATEAU, ON THE 21ST MAY, 1886, I FOUND INSECTICIDES SWARM IN NUMBERS. I SAW THEM IN HUNDREDS, THE MORNING WAS VERY DARK, AND THE BEETLES WERE FLYING IN THE AIR, AND HAVING TO FLY ON THE GROUND, AS THEY WENT THEY FELL INTO THE SWAMP, AND SWIMMING ON THEIR BACKS, THEY WERE SWIMMED.—M. W. POWELL,
LONDON, MAY 21ST, 1886.

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22nd I happened to be at Hayling Island, and as I was returning along the beach to the ferry, I caught sight of a glistening black atom in a small hole in the sand, which I at once saw was the long-sought *Acritus punctum*. By carefully examining my own footprints in the sand made some two hours previously, I was rewarded by a good series of the little creature. Acting on the experience thus gained, I tried digging small holes as traps in the sand just above high water mark in the old locality, on the Chesil Beach, and found the beetle in them not rarely on warm sunny afternoons. It probably lives in the tidal refuse (which is here so mixed with sand as to render its examination very difficult), and comes out to fly in the hot sunshine.

I may add that my friend, Mr. Moncreaff, has since taken *Acritus punctum* at Hayling Island, and has also found a specimen among his duplicates which he took there in 1871.—JAMES J. WALKER, H.M.S. Cherub, Portland: *May 11th, 1886.*

Pentarthrum Huttoni, Woll., at Portland.—I took two specimens of the very local wood-feeding weevil, *Pentarthrum Huttoni*, on May 1st, crawling on a stone wall in one of the villages in the Isle of Portland; a most unexpected capture in this almost treeless locality.—ID.

Note on the case, &c., of Oxyethira costalis, Curt.—Mr. Bolton, of Birmingham, in his endeavours to supply his subscribers with "living objects for the microscope," has done good service in elucidating the life-histories of various minute *Trichoptera*, especially *Hydroptilidae*, the cases and larvae of which he finds in his aquaria. My friend Mr. Morton, of Carlisle, has already detailed the habits of *Agraylea multipunctata* (cf. vol. xxii, p. 269) from materials supplied by Mr. Bolton. Another problem has been solved. Mr. Bolton has, on more than one occasion, forwarded to me a larva in a singularly-transparent flat case of a *broad wedge-shape*, which, when the larva is about to change to the pupal condition, is attached by its anterior angles much in the same way as described for the four angles of the case of *Agraylea*. This larva has produced *Oxyethira costalis*, the early conditions of which were unknown. I hope Mr. Morton will hereafter be able to give a detailed account from materials sent to him, and, therefore, regard this note as only preliminary. The transparency of the *larval* case is so great that a micro-photograph received from Mr. Bolton fails to define the outline at the broad end of the wedge.—R. McLACHLAN, Lewisham: *May, 1886.*

Tinodes dives, Pict., in Cumberland.—Among some *Trichoptera* taken by my friend the Rev. A. E. Eaton, in Cumberland, in 1885, I find 2♂ and 1♀ of *T. dives* from Cross Fell and Ousby in June. As British it was, I think, known only from Derbyshire, where the late Mr. Edwin Brown found it in 1868 (cf. Ent. Mo. Mag., v, p. 277, recorded as *T. Schmidtii*, Kolenati), and where I found it in August, 1869. On the continent it is a widely-distributed sub-alpine insect, frequenting weedy streams with comparatively warm water. The species of the genus *Tinodes* have unicolorous wings; but, as an exception, *T. dives* has a large spot of golden pubescence on its black anterior wings, seldom visible in captured specimens owing to rubbing, and from this latter cause it rejoices in a quantity of synonyms; it also rejoices in the possession of ♂ appendices of so peculiar a form as to render the condition of the pubescence of no consequence so far as regards specific identification.—ID.: *March 31st, 1886.*

Ants and Coccidae.—The *Lecania*, this year much less numerous than usual on the trees they affect, have been about ten days late in their nuptial preparations, but the few bright, hot days last week stimulated their dormant energies, and both sexes have thrown off their brown winter covering. The males now appear in a grey or grey-white suit; some have pushed out of it the pupa skin; some have even got a stage further, and have extruded the long silvery tails, and in a few days more the perfect bridegroom will come forth in full array, his late covering being then clear white. The female, having the care of a family before her, has appropriately a sober garb of variegated brown and yellow, which will soon become of a uniform brown hue; this will serve for her dwelling as long as she lives, and also for a nest for her eggs and young ones, and she will die there. In this community the gentlemen, and not the ladies, on bridal occasions are dressed in white. Just now these females are the object of special attention by ants (*Formica nigra*); sometimes three or four diligently watch and wait on one *Lecanium*, no doubt for some tributary exudation which is grateful to them. I do not remember hearing of this phase of their character, though their devotion to *Aphides* for a consideration is well known.

—J. W. DOUGLAS, 8, Beaufort Gardens, Lewisham: *May 10th, 1886.*

Review.

THE LARVÆ OF THE BRITISH BUTTERFLIES AND MOTHS; by the late WM. BUCKLER. Vol. I: The Butterflies. Ray Society, 1886: 8vo, pp. 202, with 17 coloured plates.

Probably most British Lepidopterists have looked forward to the appearance of this volume as much as I myself have done, and certainly none will be disappointed with it, now that it is before them; the great storehouse of facts given in this book will enable us all to gain a much larger knowledge of our native butterflies than was before possible, and it is well here to pause and feel the power of united work, how many heads and hands have joined together to make this volume what it is; none the less honour on this account to the memory of the man who worked out and noted the results so carefully; how many hours of patient labour must he have given, not only to the figures, but to the invaluable remarks on the life-histories of the larvæ; how thankful, also, must all be that Mr. Buckler found so true a coadjutor as Mr. Hellins, who has been enabled so ably to supplement the labours of his late friend and fellow-worker. Thanks to the Ray Society, there is in the volume before me the commencement of a series that promises to add more to the knowledge of our native *Lepidoptera* than any work we have seen for many years.

“Much would have more,” is an old saying; here it is used by me in a double sense—first, it implies an increased longing for the next volume; and, secondly, it means that our native entomologists must be stimulated to supply the gaps in the work before them, and though very few indeed can have either the pencil or the power of accurate observation given to our late friend Mr. Buckler, yet all may help to the utmost of their ability. Would that he had been left amongst us long enough to perfect the work himself.

After this preface, let me now briefly indicate what this volume tells us, and somewhat also of what it leaves untold. Most readers will, it is probable, turn to

the plates first, and where all are good it is difficult to distinguish any specially, yet the following amongst the larvæ known to me seem peculiarly natural and life-like: the figures of *Aporia crataegi* reproduce the larva in all its stages exactly; that of our common *Pieris brassica* is exquisite, and few larvæ are more difficult to paint than this; both *Lasiommata Meyera* and *Egeria admirable*, so is fig. 3a of *Hipparchia Hyperanthus*; *Vanessa Io* and *V. polychloros* seem to be perfect, and the drawings 3a and 3b of *Vanessa comma* are very good; I would again mention *Argynnus Paphia* and *A. Aglaia*, so also *Thecla quercus*, and fig. 4a of *Lycæna Phœbe*; of *Polyommatus Argiolus*, figs. 1 and 1a are excellent, so also are the caterpillars of *P. Alexia*. The larva of *Aporia Iris* is unknown to me, but the colouring and drawing of its varied positions are most artistic; the resemblance to a sea-slug is so great, that it would be mimetic, could any possible protection spring from the likeness. The pupæ, on the whole, are certainly more sketchy, and less detailed than the larvæ, but some, as for example, *Aporia crataegi*, *Lasiommata Egeria*, *Melitta Artemis*, and *M. Athalia*, are very faithful to nature.

There are no figures of *Colias Hyale*, *Argynnus Lathonia*, *Lycæna Arion*, *L. Acis*, and *Pamphila comma*. It must be remembered that it was only of late years that Mr. Buckler tried to procure larvæ from the continent; it probably would not be difficult to obtain three out of these five desiderata, but, alas! where would be the pencil of our author? *Erebia Cassiope* is only figured in its early stages, and some others are only drawn in their last moult; this list shows how little there is left to be done to make the work perfect.

The volume does not, however, owe its importance only to the plates; the life-histories of the larvæ are always most interesting, and, in some cases, wonderfully complete. How admirable in its details and in its exactness is the account of *Papilio Machaon*; the story of the larva from its ceasing to feed to the completion of its change (pp. 3—5) is almost microscopic in its fidelity; of course the history is "really," as he says, "the personal history of the individuals which he watched;" and it makes me long to know how the same beings would comport themselves in the wild state, what purpose in their economy is fulfilled by those wonderful retractile horns, with their secretion smelling "like an overkept decaying pineapple;" perhaps they are protective, though, judging from numerous pupæ, British *Machaon* seem quite free from parasites,* yet perhaps the pungent smell may render the larva distasteful to birds, and prevent its becoming a palatable breakfast for the sedge-bird or the bearded titmouse, perhaps even the young widgeon or the teal. These horns have no parallel in the telescopic tails of the young puss larva, perhaps their true homologue may be rather found in the processes projecting from the penultimate segment of some, at least of the larvæ of *Polyommatus*, but these last seem attractive rather than protective. The pupa of *Machaon* is only described in its one colouring of green and yellow; there is both in England, and on the continent another very differently coloured pupa (wood-brown), beautifully marbled with darker bands—from these I have reared the perfect insect frequently.

Gonepteryx rhamni.—No account of this larva from Mr. Buckler, but an admirable summary of its life in the appendix by Mr. Hellins; though *Rhamnus*

* From continental pupæ I have reared a large black ichneumon (named by Mr. Fitch *Trogus lapidator*), and also, to my grief, a very similar species, only with a steel-blue gloss, from the pupæ of *Papilio Hospiton*.

frangula is the favourite food, I can, from my own experience, corroborate Mr. Stainton's note, that *R. catharticus* is sometimes chosen. It is worth our while to contrast the life of *G. rhamni*, ten months in the perfect state, with that of *Polyommatus Alces*, ten months in the state of larva.

Colias Edusa.—The fact of this insect being double brooded is proved conclusively, and the account of the larva is very complete.*

C. Hyale.—An interesting history until the period of hibernation, but incomplete.

Of *Aporia crataegi* there is no account, but the figures only; *Pieris brassicae*, *rapae*, and *napi* are supplemented in a most interesting manner by Mr. Hellins. I can add mignonette as a favourite food of *P. rapae*, also *Alliaria officinalis* and *Cardamine pratensis* to the food plants of *Pieris napi*. The history of *Pieris Daplidice* is very full and most interesting, and the deduction (from the larva dying of cold as early as the 28th of September) "that *Daplidice* is quite unsuited to our climate, and is an insect belonging to a warmer country," is probably quite correct.†

Anthocharis cardamines is only described by Mr. Hellins in the last moulting. My first acquaintance with this larva was at Lewisham, when it was pointed out to me by Mr. Stainton on the flower stems of horse-radish in his garden. Many of the *Cruciferae* are mentioned as its food-plants (*Sinapis arvensis*, *Turritis glabra*, and others); I should have been inclined to look on *Cardamine pratensis* as its favourite, but though this is in the list, Mr. Harwood looks on *S. arvensis* as first.

The description of *Leucophasia sinapis* is brief, but very good, that of the strange pupa excellent; I have watched the female depositing eggs upon *Lotus corniculatus*.

The larva of the various *Satyridae* are so retired in their habits, and hide so deftly amongst the grass to which they for the most part much assimilate in colour, that they are not often met with, except by those who specially search for them; the life-history of most, when supplemented by Mr. Hellins' notes, is highly interesting, *Erebia Cassiope* (*Epiphron*) being the only one left quite incomplete, the larva of this insect dying during hibernation, and therefore before attaining the full growth.

With regard to *Lasiommata Egeria* and *Megara*, one of my puzzles, is yet left undetermined. By the dates of Mr. Hellins, *L. Egeria* is found in Devon in April and May.† My dates are April 9th, 1843, Teignmouth, common; April 12th, Lympstone; again in June and July; and finally my latest date is September 25th, 1865, Teignmouth: in September, 1873, it is noted as common at Heidelberg. Are the April and June broods the same flight, or do the April insects pass the winter in the pupa state? I can fully confirm the fact that the eggs of the autumn brood

* The idea of the older entomologists was that the female lived through the winter and deposited her eggs in the spring. The dates here given militate against this—eggs laid by a female October 10th (Mr. Barrett, Pembroke), and June 12th (Rev. E. T. Daubeny, Bedhampton). I have myself seen a female depositing eggs late in October at Lympstone, Devon, and another on June 27th in the Rhone Valley. In both cases the eggs were laid on leaves of clover.

† Mr. Barrett gave the same reason for the larvae of *Deiopeia pulchella* not arriving at perfection; the coldness of our autumn months preventing the larvae from feeding up fully is very likely a powerful factor in preventing these insects from gaining a more permanent footing in our island.

† My old theory of these broods was that the larvae from the April or May butterflies produced the autumn brood of August and September; that the eggs from these came to larvae which fed through the winter and came to perfection in June, and that larvae from these completed the cycle and appeared in April and May, passing the winter as pupae. This is disproved by Mr. Hellins' careful notes; but I imagine that in mild winters larvae may feed instead of hibernating, and pupate early, or in some exceptional cases, change late in the autumn.

develop larvæ which hibernate as such ; but with regard to *Megæra*, I found in November, 1879, at Teignmouth, a full-fed larva which suspended itself, and became a pupa at once. It was unfortunately ichneumoned ; but an egg laid in August produced a larva which, in a warm room, fed up, became a pupa, and emerged November 15th. This proves nothing, as artificial heat was employed, but the full-grown caterpillar was at large. The earliest appearance of *Megæra* noted by me is May 2nd.

Of *S. Hyperanthus* I have the following notes : "Eggs laid freely by a female on July 16th, larvæ lived through the winter, became full fed in the following June, did not suspend themselves, but changed into pupæ on the surface of the earth and emerged in July." The notes and figures of *S. Semele* are most interesting, both larva and pupa are unknown to me, but they bring a piece of entomological gossip of by-gone days back to my mind. In my student years the finding of a larva of *S. Briseis* near Stoke Newington was only a few years old, and had not passed out of memory, and Mr. Edward Doubleday (to whose den under the British Museum I was a frequent visitor, and whose kindly help on many entomological points I still gratefully remember), once said to me, "I asked the gentleman who found it if it hung itself up by the tail, and when he answered, no, it buried, I then felt sure that there was no mistake."

The history of *Apatura Iris*, and of the whole genus *Argynnis* amongst the *Nymphalidae*, is wonderful in its minuteness of detail, and were I not sure that every Lepidopterist would get the book, I should quote the history of the full-grown *Argynnis Euphrosyne* larva as specially interesting. This may be said, however, from my experience of *Argynnis Aglaia*, that the larva does not always conceal itself before pupating, as I have found both the suspended larva and pupa at Lynmouth on the bare limestone rock. *Argynnis Lathonia* and *Melitaea Cinzia* are without any description, though the adult larva of the latter is well figured. With regard to *M. Athalia*, *Melampyrum pratense* and *M. sylvaticum* are the only food-plants given : unless my memory fails me, Mr. Reading of Plymouth found the larva feeding on the common wood sage, *Teucrium scorodonia*. I once found a brood of *M. didyma* larvæ in the Saas Valley, feeding on *Teucrium montanum*, and succeeded in rearing some of them. It will be borne in mind that *Melampyrum* is scrophulariaceous, while *Teucrium* is labiate.

The life of our only European *Erycina*, *Nemeobius Lucina*, is well worked out,* and the *Lycenidae* are admirable. Neither history nor figure of *Lycæna Acis* is given, and there is no figure of *Lycæna Arion*, but its early history, which is all that is known, is worked out as far as the time of hibernation. There are figures but no written history of *Thecla pruni* and *Th. w-album*. With regard to *Lycæna*

* In Mr. Edwards' work on "The Butterflies of North America" it is interesting to note how nearly in its larva and mode of pupation, as well as in the imago state, the genus *Lemonias* approaches our *Nemeobius* ; and it may be worth a passing remark, how often insects of the same genus resemble each other, as indeed is natural, in the antecedent stages. Thus not only is the larva of the closely allied *Papilio Zolicanus* almost identical with that of *P. Machaon*, but the larva of so different species as *P. brevicauda* is very similar, not only in the adult stage, but even in the white saddle-like marking of the young larvæ, and this seems also to be the case with *P. Turnus* and its allies, *Danaus* and *Rutilia*, though the adult larva is much less striped. *P. Ajax* seems rather to resemble *Podalirius* ; so the larva of the widely different *Apatura celis* is very like that of *A. Iris* ; and even the larvæ of the very distinct *Diippus* group of *Limenitis* are exactly similar in form, though not in colour, to those of *L. Sibylla*. Many other examples might be quoted, but the North American *Grapte* and our own *Acronycta* prove that the rule is not universal.

Argiolus, I have two figures taken by myself from larvæ found in October on ivy, which exactly resemble the figures 1 and 1a of plate 14, and which were drawn from the larvæ found in summer on the holly. It is not always the habit of *Lycæna Egon* to pupate on the surface of the earth, for I have often reared it from pupæ found at Zermatt attached to large stones, in the usual manner of *Lycæna*, viz., by a button at the tail and a girdle around the middle; the full-fed larva was also frequent, and there they probably ate some species of *Astragalus* or *Oxytropis*. The life-history of *L. Medon* given in the book is very full and most important, as it establishes conclusively the identity of *L. Medon* and the form *Artaxerxes*. Is *L. Medon* ever double brooded in England? When speaking of the horns of *Papilio Machaon*, mention was made of processes which existed in some of the larvæ of the *Lycænae*; they are not mentioned in this book, but the opportunity given by this paper is taken to direct the attention of British entomologists to their existence. Dr. Hagen's account of them seems the clearest. Speaking of *L. Argus* and *L. Corydon*, he says: "You find on the penultimate segment outside and behind the stigmata two large white spots, each one of which evaginates a white membranous tube, just like the finger of a glove, the top of which is not entirely drawn out." "On the ante-penultimate segment is a large and transverse opening behind and between the stigmata near the apical border. It looks like a closed mouth with its lips, but I have not seen anything protruding from it; but in an alcoholic larva of *Argus* I saw an ovoid evagination."

These processes were first, I believe, discovered by Guenée, and the fact that ants haunted the larvæ and followed them for the sake of the secretion was first remarked by Prof. Zeller. This ant companionship is detailed in a very interesting manner by Mr. Edwards in his "Butterflies of North America," under the head of *Lycæna pseudargiolus*, from which much of the above account is quoted.*

From the *Lycenidae* we pass to the skippers, to me almost the most interesting part of the book, since I have never seen as yet one larva of any of the group. Fortified by the clues here given, I shall now hope to find them, and learn somewhat of their economy from personal experience. *Pamphila comma* is without figure or description, and the only fact that is recorded about it is, that it hibernates in the egg state.

The reason that in this notice attention has most pointedly been called to omissions, is in the hopes that even yet the eggs or larvæ of some of the species may be sent to Mr. Hellins, so that when the work is completed, some more supplementary notes, such, for example, as are here given in the account of *H. Tithonus*, may yet be in store for us.

In summing up the importance of this volume, one great fact must be borne in mind, that the student can now get the figures and descriptions of almost all our native butterflies from the fresh and accurate observations of one man, not by reference to the descriptions of various authors in various works difficult to procure, or accounts scattered through different magazines, but in one volume of entirely

* Mr. Edwards concludes, from his own observations, that the return which the ants give for the liquor that they love is to protect the larvæ from ichneumons, and he relates how he saw them so ward off the attack of an *Anomalon*. We knew that they kept cows in the *Aphides*, but here we find them taking care of milch elephants; verily, "the ants are little upon the earth, but they are exceeding wise."

original work. It was the duty of entomologists to subscribe to the Ray Society before,* it becomes doubly so by the publication of this volume.

Perhaps some apology is needed for the length of this notice, considering that many of the most interesting parts of the book have been before published in the pages of this Magazine, but the great importance of the work, and the amount of collected original information which it contains, must be my excuse. It will prove for many years *the text book on the larvae of British butterflies*.—R. C. R. JORDAN, Edgbaston: *March, 1886.*

THE SOUTH LONDON ENTOMOLOGICAL AND NATURAL HISTORY SOCIETY,
April 15th, 1886: R. ADKIN, Esq., F.E.S., President, in the Chair.

Messrs. T. D. A. Cockerell, A. J. Windybank, T. P. Newman, W. H. Wright, T. Gibbs, Jun., and W. F. de V. Kane, were elected Members.

Mr. Mera exhibited a fine series of *Syntomis Phegea*, Linn., bred from ova deposited by a female taken in Italy. Mr. E. Joy, a variety of *Cænonymphia Pamphilus*, L., taken at Hadley Wood, near Barnet. Mr. Tugwell, a bred series of the Dover form of *Cidaria suffumata*, Hb. Mr. Wellman, specimens of *Phoxopteryx upupana*, Tr. Mr. Billups exhibited a curious construction, which had been found by Mr. J. T. Williams under a stone in his garden at Fooths Cray; the formation consisted of about fifteen or sixteen fusiform cocoons, composed of a felt-like material and arranged side by side, vertically and transversely, the whole forming a pear-shaped mass; each cocoon contained a larva which Mr. Billups said was certainly not Dipterous nor Hymenopterous, but might probably be the larva of a species of *Lepidoptera*. Several Members concurred in this opinion.

May 6th, 1886: The President in the Chair.

Messrs. F. Enock and C. Brady were elected Members.

Mr. Elisha exhibited a bred series of *Antispila Pfeifferella*, Hb., Stn., with specimens of the mined leaves, and the pupa cases cut out from the leaves. Mr. Wellman, *Cidaria suffumata*, Hb., including the Dover form; a fine series of *Clotera reclusa*, Fb.; also *Adela cuprella*, Thnb., Fb., Stn. Mr. West, a fine series of *Ephyra punctaria*, L. Mr. Mera, *Aleucis pictaria*, Curt. The President showed a long series of *Endromis versicolor*, L., and stated in reference to his exhibit, that in March, 1884, he received twenty-five ova from Mr. Gibb, the parent moth having been inbred, originally from Rannoch specimens; in due course the larvae fed up, the first moth (a male) emerging on the 19th April, 1885, and was followed by eight others, all females, and this year he had bred twelve males. He thought it was a fact worthy of notice, that the first year he should breed all females, and the next all males. Of course his observation only extended to a portion of the brood, and it would be interesting to know whether or not the remainder of the brood had emerged in the same manner. Mr. Carrington communicated notes of a visit at Easter to Selborne, the home of Gilbert White. In the report of the Meeting on

* To show what entomology owes to this Society, I may give the following list of works since 1865:—Hemiptera-Heteroptera, Douglas and Scott, 1865; British Aphides, Buckton, 1875, 1877, 1880, 1882; Colembola and Thysanura, Lubbock, 1878; British Phytophagous Hymenoptera, Cameron, 1882, 1884; not including the volume on *Oribatida* published in 1883.

February 18th, it should have been stated that *Meligethes exilis* and *Anthicus Schaumi* were only received from Lincoln, not taken there.—H. W. BARKER and W. A. PEARCE, *Hon. Secs.*

ENTOMOLOGICAL SOCIETY OF LONDON, *May 5th, 1886* : Prof. J. O. WESTWOOD, M.A., F.L.S., Hon. Life-President, in the Chair.

Mr. William Saunders, the President of the Entomological Society of Ontario, was present as a visitor.

The following were elected Fellows of the Society, *viz.* :—The Rev. E. N. Bloomfield, M.A., Mr. Frederick Fitch (formerly Subscribers), Mr. A. J. Rose of Stoke Newington, and Mr. William E. Nicholson of Lewes.

Mr. Jenner Weir exhibited a large and spiny Lepidopterous larva which he had received some years ago from the late Mr. Andrew Swanzy, who obtained it in Western Africa.

Mr. Stevens exhibited a number of *Coleoptera* recently obtained in the Isle of Wight, including *Apion sorbi*.

Mr. Crowley exhibited four specimens of *Leto Venus*, a large and handsome moth belonging to the family *Hepialidae*, from Natal.

Mr. Howard Vaughan exhibited a long series of *Cidaria immanata* from Kent, Surrey, and other southern counties, Perthshire, Isle of Man, Isle of Arran, the Orkneys, and Shetlands. He also exhibited *C. russata* from various localities in the South of England, and from Perthshire, Argyllshire, and the Islands of Arran, Lewis, and Hoy. Mr. Vaughan further exhibited varieties of *C. suffumata* from Dover and Darlington.

Prof. Westwood commented on the interesting nature of the exhibition of *C. immanata*, and stated that he had never before seen such a wonderful collection of varieties of a single species.

Mr. McLachlan exhibited, for Mr. G. Lewis, living specimens of *Paussus Favieri* (Fairm.), lately collected in Portugal by Mr. Lewis, in nests of the ant *Pheidole megacephala*, var. *pallidula*.

The Rev. W. W. Fowler exhibited *Staphylinus latebricola* and *Quedius truncicola*, both from the New Forest.

The Secretary exhibited, for Mons. H. de la Cuisine, of Dijon, coloured drawings, life-size, of a variety of *Urania Cræsus*, and a variety of *Papilio Memnon*; and Prof. Westwood made some observations on them.

Mr. G. Elisha exhibited specimens of *Antispila Pfeifferella*, together with the cases, and the leaves mined by the larvae.

Mr. J. W. Slater read a paper "On the Origin of Colours in Insects," in which he showed that the assertion of Mr. Grant Allen, that all brightly coloured insects were flower-haunting species, was incorrect; and that many brilliantly coloured insects were carnivorous. Mr. McLachlan said that the physiological question in connection with colour had not been sufficiently considered: he thought that colour in many insects was to a great extent dependent upon the circulation of fluids in their wings. The discussion was continued by Prof. Westwood, Mr. Goss, The Rev. W. W. Fowler, Mr. Jacoby, and Mr. Weir.—H. GOSS, *Secretary.*

NOTE ON SOME BRITISH COCCIDÆ (No. 3).

BY J. W. DOUGLAS, F.E.S.

Having now before me Foerster's little-known article "Ueber Schildläuse," to which I alluded from report only at p. 248, vol. xxii, with respect to the presumable identity of certain reputed species of *Lecanium*, I can revert to it with greater precision. He says:—

"The male of all the species of this genus must be most carefully examined, for only on the fully developed males can the specific character be founded with certainty. The early writers, mostly without knowledge of the male, named the species after the plants on which the female was found, a mode of proceeding that necessarily led to many species being placed together as a single one, as I have fully proved."

"With respect to the determination of the species, it is not difficult to distinguish the *Coccus tiliae* of Réaumur and Linné, for the former has long ago given a figure of it in the 4th volume of his 'Mémoires'; but if it be agreed that the *Coccus tiliae* of both authors is the same, so also it is incontestable that this *Coccus* is not limited to the lime tree only, but that it goes to other trees, and in each case is named differently in accordance with its habitat. In former time, and also again this year, I have observed it on the following, namely, *Populus tremula*, *Ulmus campestris*, *Acer pseudoplatanus*, and *Prunus padus*, also on pear and cherry trees. Further, it appears to me probable that *Coccus quercus*, *betulae*, *carpini*, *coryli*, and perhaps also *oxyacanthæ*, Linné, must form one and the same species with that here treated on. Under these circumstances, the name *tiliae* can no longer be retained, and I therefore allow myself to bestow on it a new one, which has reference to the wandering life of the species, and call it *Lecanium vagabundum*."*

The soundness of Foerster's theory in its entirety is invalidated by the fact that some of the species he mentions, as they are now understood, belong to the genus *Pulvinaria*, of which the female scales are remarkably different by having in their ultimate state a protruding ovisac, and therefore they cannot be identical with any true *Lecanium*. Such a proposition by one having such a nice power of observation as Foerster is incredible, and so it is most likely he had in view scales of species of true *Lecanium*, and that he misapplied to them the names he has quoted; thus he may have had scales of *Lecanium genevense* and called them *oxyacanthæ*, which is a *Pulvinaria*, both species feeding at the same time on one kind of tree. Linné did not describe his *Coccus oxyacanthæ* (S. N., 742, 21); he merely says "Habitat in *Crataego oxyacanthæ*," and refers to "Réaumur, Ins.," iv, t. 6, f. 11, 12, which figures clearly denote a *Pulvinaria* with a protruding woolly ovisac; whereas, *L. genevense* has no external ovisac, and is a true *Lecanium*. Or it may be that Foerster only saw the scales of the

* This is the name quoted by Kaltenbach in his "Pflanzenfeinde," of which Signoret had no trace (Ess. Cochin., p. 466).—J. W. D.

Pulvinaria, before the period of oviposition, then they might easily pass as a *Lecanium*. So also of the other *Pulvinaria* he mentions. At any rate, with such reservations, the subject deserves investigation, for there may well be not so many species of *Lecanium* or *Pulvinaria* as is believed. Foerster's contention is that while different though similar species may feed on one kind of tree and get one name, yet, on the other hand, one species may feed on different kinds of trees and thus get several names.

Targioni-Tozzetti, in his "Catalogus," 1868, places together as one species (under the name *Lecanium ulmi*, Walker), without any mark of doubt, and apparently without knowing what Foerster had proposed, *Coccus ulmi*, Geoffr., *Coccus coryli*, Linn., *Chermes coryli hemisphæricus*, Geoffr., *Coccus tiliæ*, Linn., *Chermes tiliæ hemisphæricus*, Geoffr., and *Calypticus lævis*, Costa, but leaving *Lecanium aceris* = *Coccus aceris*, Modeer, Fab., Gmel., Curtis, as a distinct species. Now, Walker (List of Hemipterous Insects in Brit. Mus., iv [1852], p. 1074, No. 33), merely cites *Coccus ulmi*, Linné, without giving any description or reference to the British Museum collection, and does not put any other reputed species as equivalent to it, quoting only the *ulmi* of the various authors who have described or noticed the species of that name; so that the reference by Targioni-Tozzetti to the *Lecanium ulmi* of Walker is misleading and futile, but this does not invalidate his opinion of the unity of the reputed species he mentions.

Signoret describes as distinct species, *L. aceris*, *æsculi*, *corni*, *coryli*, *genevense*, *pyri*, and *tiliæ*, allowing that they are much alike, but with certain small differences in the scale of the female or in the imago of the male deemed of specific value, and stating that they have in common on the "derme" of the scale of the female a microscopic tessellation.

The solution of these and other problems, *ut infra*, is within the reach of the younger men of this generation, but scarcely in the range of my own probabilities, which are within measurable distance of an end. Time is on their side but not on mine, for, as the French say, "Quand on est mort c'est pour longtemps."

In the "Jahrbücher des nassauischen Vereins für Naturkunde," 1884, Dr. Rudolph Goethe has an article on the *Coccidæ* affecting fruit trees and vines in the Rhine district, illustrated with three plates, and the paper is in several respects of interest to us, as most of the species have been, or may be, found in Britain.

I note the following:—

Mytilaspis pomorum, Bouché.

Externally nearly all the forms of *Mytilaspis* are so very similar, that they might be believed to constitute but one species; but good characters for the separation of species exist in the pattern of the fringe of the last abdominal segment, and more especially in the number and relative position of the groups of the wax-excreting spinnerets on the inferior surface of the same segment. In the European species there are five groups—one anterior (mesal of Comstock), one on each side lower down (anterior-lateral), and one still lower (posterior-lateral). The number of spinnerets in each group is tolerably constant in a species, but it varies within certain limits, not only in the species, but even in the individual, for it is not always exactly the same in the corresponding lateral group.

For some years past I have known the scales of a *Mytilaspis* common on red and white currant bushes, and latterly I have found, but more sparingly, scales on the black currant, always on the two-years'-old shoots, all three agreeing exactly in external appearance and similarly not separable from *M. pomorum*, the species very abundant on apple trees. Dr. Goethe has examined the black currant form with reference to the formula of the spinnerets, and finds that they agree with the form on the apple, but he gives the number of spinnerets in the respective groups as 10, 18, 16, whereas Signoret gives them (for *pomorum*) as 17, 10, 14. This difference, however, is not of importance in a specific sense, for I find that, while the scales on the apple and black currant are identical as regards the fringe, the spinnerets in both vary in number in the respective groups, thus, 8—13 anterior, 14—21 ant. lat., 9—14 post. lat.* Comstock (Report, 1880) gives the numbers as 11—17, 16—21, 16—21 in the respective groups. Maskell (Trans. N. Z. Inst., xi, 194) gives the numbers, as shown by scales from apple, plum and lilac, as 17—20, 17—19, 14—17 respectively. There can be no doubt that Goethe's species is *M. pomorum*, Bouché, but he erroneously calls it *M. conchiformis*, Gmelin. [I may here mention incidentally that I find the *Mytilaspis* on the dogwood (*Cornus*) and plum trees to be identical with the species on the apple (*M. pomorum*) as to abdominal fringe and spinnerets; Bouché had stated they were the same species, but I apprehend without microscopic test.]

Mytilaspis linearis, Geoffr., Modeer.

Gmelin (Syst. Nat., 13 ed., p. 2221, No. 37, 1788) describes *Coccus conchiformis* in these words, "Habitat in ulmo, angustus, fuscus."

Signoret adopts the name for a species of *Mytilaspis* living on the elm, which he finds differs essentially from *M. pomorum*, Bouché, inasmuch as the spinnerets are 6—7, 8—9, and 5—6, in the respective groups. He admits, however, that at first he had been misled by Curtis in employing the name *conchiformis* for the apple feeder.

Réaumur expressly states that his figure t. 5, fig. 7 (Gallinsecte en forme de coquille) represents an elm-feeder, and the figure is cited by Gmelin; but he also gives as a synonym of his *conchiformis*, *Coccus arborum linearis*, Modeer, "Act. Gothenb." i, 22, 14 (1778), and Geoffroy "Hist. abr. des Ins." 569, 17 (1764). The latter quotes Réaumur, yet apparently losing sight of the restricted habitat on

* Mr. G. S. Saunders has kindly given me the advantage of his extensive experience in the preparation of minute entomological objects by mounting these and other *Coccidae* for microscopic examination.—J. W. D.

the elm, says vaguely "Celui-ci vient sur les arbres." He was the first to name Réaumur's species as *Chermes arborum linearis*. Modeer (*l. c.*) cites Réaumur and Geoffroy, dropping "arborum," and giving the name as "linearis" only (so that he was not correctly cited by Gmelin), and he says the insect "lives on the branches of elm trees." It thus appears that the prior name of the elm feeder is *linearis*, and it should not have been supplanted by Gmelin's *conchiformis*; thus also Signoret's *linearis* (*nec* Geoffr., Modeer, as he has it) requires another name. At any rate, Goethe's *conchiformis* is not the *conchiformis* of Gmelin. I find the true *Mytilaspis linearis*, Geoffr., Modeer, rarely on elms; I believe it is now first introduced as British, and that the *conchiformis* of Curtis and Walker is only *Mytilaspis pomorum*, Bouché, Signoret. Briefly the synonymy is:—Gallinsecte de coquille, Réaum. *Chermes arborum linearis*, Geoffr.; *Coccus linearis*, Modeer; *Coccus conchiformis*, Gmel.; *Mytilaspis conchiformis*, Sign.

Mytilaspis vitis, Goethe, *sp. n.*

This form Dr. Goethe finds on vines, and it is not impossible that it may occur in Britain. The formula of the spinnerets is given as 9—11 anterior, 14—16 ant. lat., 10—12 post. lat., and the species is regarded as quite distinct from *M. pomorum*, which it resembles otherwise. The scales of the ♀ are found on the two-years'-old wood. The larvæ are attached to the young shoots, especially near the buds, where they are very perceptible, as the place where the rostrum is inserted becomes brown or blackish. With the discoloration a swelling is associated, so that the young creature sits on a small eminence.

Lecanium pyri, Schrank.

Dr. Goethe says he finds this not only as usual on apple and pear trees, but also on whitethorn; by the latter I apprehend he means *L. genevense*, Targ.-Tozz., which he does not mention by name.

Lecanium cerasi, Goethe, *sp. n.*

Dr. Goethe finds, principally on cherry trees, but also on plum trees, in the spring, female scales of a *Lecanium* which he says do not agree with any described by Signoret. They are 4 mm. long, 3 mm. broad, and 2½ mm. high, colour reddish-yellow, shining; the male, which appears in May, has white wings with a dark red spot between the margin and the nerve, body red-brown. I also find such scales here on the cherry trees, but have not been able to distinguish them from *L. pyri*, Schrank, nor do the scales or imago of the male afford any distinctive characters. As to the remark about the descriptions by Signoret it must be noticed that he only refers to the adult scales, the yellow colour mentioned by Goethe becomes brown in a short time, as in other reputed species of this group.

I also find similar scales on laurel (*Prunus laurocerasus*); I notice on the grey scales of the male that the oval coronet on the back shows distinctly white, as Signoret represents as existing in *L. prunastri*, but the imago differs not from *L. pyri*.

Lecanium variegatum, Goethe, *sp. n.*

This, it is stated, is found somewhat abundant on plum trees and apple trees, singly on the latter. The specific name is adopted, because the ♀ scales show a remarkable variegated coloration up to the time of oviposition. At first yellow-brown

they become bright red, with a broad dark stripe lengthwise on the back, which is interrupted by fine white transverse streaks. At this stage the scales are nearly 3.5 mm. high, 4 mm. broad, and 4.8 mm. long, consequently very globular. With the development of the eggs they become tubercular, thin-shelled, uneven, furrowed and tumid, and the variegated colour merges into a shining brown-red. The young larvæ are dark yellow, and of a characteristic stumpy form. The male imago, found in April and May, has the body and head dingy red-brown, legs light yellow, antennæ dark brown, wings between the margin and nerve red-brown.

This may be a distinct species, not hitherto separated from *L. pyri*, for although generally not much importance is due to the variegation of the ♀ scales, which is more or less observable in all the reputed species of this group of them, yet the transverse white streaks appear to be special to the form now mentioned, and may prove to be a specific character. I find such scales here on plum and apple trees, and also singly on a pear tree, in May; but I have yet to learn how to distinguish the male from *L. pyri*.

Lecanium ribis, A. Fitch.

Under the head of *Lecanium persicæ*, Dr. Goethe introduces a form which he finds on gooseberry and currant bushes, which he is inclined to believe is identical with that species. Assuming that it is the same as that I find here common on gooseberry and currant bushes, I would rather believe it to be *L. ribis*, which is much more like *L. rugosum*, Sign., than *persicæ*, yet I think distinct. Like Dr. Goethe I have never found a male of this currant feeder.

8, Beaufort Gardens, Lewisham :

May 31st, 1886.

DESCRIPTION OF TWO NEW SPECIES OF *TERACOLUS*.

BY ARTHUR G. BUTLER, F.L.S., F.Z.S., &c.

The following interesting species have recently been presented to the Museum Collection by Mr. J. M. E. Johnston :—

TERACOLUS JOHNSTONI, *sp. n.*

♀. Allied to *T. Eris*, but larger and in some respects more like the female of *T. subfasciatus*; the apical border of the primaries being bright copper-brown instead of black, bounded internally by three diffused bright ochreous and one white spot in a curved oblique series, these again bounded internally by an oblique black band from costa to third median branch, the latter continued by two spots (the upper crescentic, the lower sub-quadrata) upon the median interspaces; the internal blackish streak narrow, and at its outer extremity curving up in the form of two unequal spots almost to the first median branch; secondaries of a dead white tint, slightly pink in certain lights, and with faintly yellowish border; the base slightly dusky; a transverse tapering bifid brownish dash from costal margin to second median branch: below the differences are even more marked, the apical area and costal margin of primaries being of a bright gravel-ochre colour; six brownish spots

in a biangulated series from costa to first median interspace, and a brown spot at the end of the cell; secondaries entirely bright gravel-ochre, a spot at the end of the cell, the tapering costal dash of the upper surface and five inconspicuous spots in continuation of the latter coffee-brown; pectus clothed with salmon-pink hair.

Expanse of wings, 56 mm.

Graham's Town.

In the Hewitson collection there is a pair of this species, mixed up with three or four other species, as *T. Eris*: the male differs from that sex of *T. Eris*, in having a conspicuous black spot at end of cell, the apical patch elongated transversely instead of along the costa, its outer portion cupreous on the border, grey-brown within the border, the spots upon it broad, oval and bright ochreous; the black extero-discal area inclosing two white unequal spots in continuation of the sub-apical series, and below these spots with a dentate-sinuate white border; the black costal band of secondaries is slightly differently shaped from that of *T. Eris*, and (as in the female) there are no marginal spots to these wings; on the under surface the primaries have a black spot at end of cell as above, also two small spots just beyond the centre of the median interspaces; the costal margin and apical area and the entire surface of secondaries deep rosy flesh-coloured; the secondaries with a tapering brown dash from costal margin, and a small brown spot at end of cell; pectus with pink hairs.

Expanse of wings, 58 mm.

Hewitson has, as usual, no definite localities on his specimens, the male being labelled simply "Cape," and the female "S. Af."

The following, which is the largest species of the group, I describe as—

TERACOLUS OPALESCENS, sp. n.

♀. Nearest to *T. Maimuna* from Angola, considerably larger, the wings white with rosy opaline shot, much more pronounced, especially on the primaries, than in any other known species; primaries above with the costal border narrowly irrorated with brown scales, giving it a greyish tint; external and internal borders very broad, more so than in *T. Maimuna*, the three sub-apical yellow spots only represented by a few scattered yellow scales, but the white patch at external angle wider than usual; secondaries with the marginal spots unusually large; the spots across the disc forming a regular arch instead of an angle followed by an arch as in *T. Maimuna*, the first spot only large, the others quite small; primaries below white, the apical area tinted with clear sulphur-yellow, and not crossed by rust-red spots as in *T. Maimuna*; three spots only on the disc, two of which (on the median interspaces) are large; a transverse black stigma at the end of the cell; secondaries clear sulphur-yellow; a small red-brown spot at the end of the cell, and eight in an arched series from costa to interno-median fold across the disc; costal margin gamboge-yellow; body below white.

Expanse of wings, 62 mm.

Delagoa Bay.

The female of *T. Maimuna* measures 57 mm. in expanse of wings; it is always more or less, and sometimes wholly bright yellow on both surfaces; when white above, it has three conspicuous yellow sub-apical spots, and the anterior half of the wing on the under surface washed

with yellow; whilst the apical area of the primaries and the whole of the secondaries on this surface are bright golden buff approaching a mustard-yellow; the external border on the upper surface of the primaries is browner, and does not run so far along the costa, is narrower throughout, and the inner border is narrower, and fades away into greyish flesh-colour at the base in the *Angola* species. I therefore have not the slightest hesitation in considering these two to be abundantly distinct, though allied species.

As it appears to me to be always for the good of science to correct errors as soon as possible after their publication, as I have monographed the genus *Teracolus*, and, lastly, as the British Museum possesses the finest and most complete collection in the world of these beautiful butterflies, I think it my duty to add here a few notes upon the species figured and remarked upon by Dr. Staudinger in his work now publishing. I have no desire to dispute his right to place his species in three, or if he prefers it in more genera, but simply to point out a few inaccuracies arising from the effort to work out a difficult group with insufficient material.

On plate 23 of his work, Dr. Staudinger figures the following:—

1. *Idmais Eris*, Klug, ♂, correctly identified.

2. *I. Vesta*, Reiche, ♂. Our examples of *T. Vesta* are males, and correspond with the original figure; the species figured by Staudinger is perfectly distinct, and is my *Teracolus argillaceus*; it is considerably smaller than *T. Vesta*, the base of the wings above is not black as in that species, the apical area of primaries and entire surface of secondaries below are pinky-ochraceous, instead of pale sulphur-yellow, and the central band of the latter wings is the only dark one, though Staudinger's figure fails to show this difference.

3. *I. Pleione*, Klug, ♂, correctly identified.

4. *I. costalis*, Stgr., a new species allied to *vestalis*.

5. *I. venosa*, Stgr., ♂. This appears to me to be allied to *Belenois Charina*, but to be figured from an example in which the antennæ are broken short off: if this is so, we have a nearly allied species from the Nyanza; ours is, without question, closely related to *B. Charina*.

6. *Teracolus subfasciatus*, Swains., ♂, correctly named.

7. *T. protomedia*, Klug, ♂. The insect figured is a female; we have a series of both sexes.

8, 9. *Callosune Jobina*, Butl., ♂, ♀, correctly named.

10, 11. *C. Jalone*, Butl., ♂, ♀, apparently rightly named, but not well figured.

12. *C. Amina*, Hew., ♂, correctly named.

13, 14. *C. cinerascens*, Butl., ♂, ♀, correctly named.

15, 16. *C. Auxo*, Lucas, ♂, ♀, correctly named.

17. *C. Achine*, Cram., ♂. The species figured is the *T. Omphale* of Godart.

18. *C. Haevernichii*, Stgr., ♂. This is the male of my *T. harmonides*. Google

19. *C. Gavisa*, Wallgr., ♂, correctly named.
20. *C. vulnerata*, Stgr. Possibly the male of my *Teracolus incretus*.
21. *C. Danae*, Fab., ♂, correctly named.

In conclusion I would remark that personally I see no grounds, upon the variable and purely specific differences indicated in Dr. Schatz's figures of three isolated species, for separating the genus *Teracolus* into three.

British Museum :
March, 1886.

DESCRIPTION OF TWO NEW SPECIES OF *PIERIDÆ* FROM
ZANZIBAR.

BY H. GROSE SMITH, F.E.S.

MYLOTHRIS SAGALA.

Upper-side.—Anterior-wings white, irregularly irrorated with brown-black, especially on the costa, in the cell, and towards the base, where the irroration is so close that the wings are nearly brown-black. Posterior-wings yellow; the base and an irregularly defined space near the apex, between the costal nervure and the first sub-costal nervule, thickly irrorated with brown-black; minute black spots on the margin at the end of the nervules.

Under-side.—Anterior-wings white; costa grey; apex faintly tinged with yellow. Posterior-wings yellow, with small black spots on the margin at the end of the nervules.

Expanse of wings, 2½ inches.

Habitat: Sagala, about 100 miles inland west from Zanzibar.

In the collection of H. Grose Smith.

TERACOLUS CALLIDIA.

Upper-side.—Dusky white, irrorated at the base with black. Anterior-wings with a yellow-ochre apical patch extending over one-third of the wings, margined internally with a dusky black band, the costal and exterior margins, nervures at the exterior margin, and a spot at the end of the cell, dusky black. Posterior-wings with a black spot near the centre of the costal margin, and marginal spots at the end of the nervures.

Under-side.—On the anterior-wings the apical patch is indistinct and paler without the internal band, but crossed in the centre with an angulated row between the nervures of five dusky black spots, a spot at the end of the cell, and a dusky black band at the base. Posterior-wings brownish-white, a yellow-ochre spot between two brown spots on the upper discocellular nervule, and a curved row of spots from near the centre of the costa to near the anal angle. Expanse of wings, 2 inches.

Habitat: Zanzibar.

In the collection of H. Grose Smith.

NOTES CONCERNING *CHRYSOPOA VENTRALIS, PRASINA,*
ABDOMINALIS, ASPERSA, AND ZELLERI.

BY ROBERT McLACHLAN, F.R.S., &c.

The question of the specific distinction, or otherwise, of the conditions bearing the above names has long engaged my attention, and that of other European entomologists interested in *Neuroptera-Planipennia*.

Very recently, circumstances induced me to give the subject more special investigation, and the remarks I here offer may be of interest, even if my conclusions do not meet with universal acceptance.

Those who have paid some attention to European *Chrysopæ* will recognise the names enumerated above as representing a group of species, varieties, or conditions, characterized by the wings having a partially black and partially pale neuration, *with a (usually) conspicuous black dot at the extreme base of the costa: a black point between the antennæ*; two black marks on either side of the face (on the genæ and clypeus respectively); the palpi annulated with black; the pronotum above with black (or blackish) points (often connected into two longitudinal lines), and with two or three black spots (occasionally connected) on its edges. These characters are common to all, but there are often additional points on the basal joint of the antennæ, on the vertex, on the mesothorax, &c. And the whole question virtually concerns the amount of importance to be attached to the number and position of the black points on the head, thorax, and abdomen, and the condition of the black variation in the neuration. All seem to agree in form, and in special structure (so far as this can be ascertained). If I mistake not, far too much importance has been given to "spotting" in differentiating European *Chrysopæ*, and the same remark probably obtains with equal force in extra-European forms, notably in the North American group of which *Ch. oculata*, Say, may be taken as an example.

Ch. VENTRALIS, Curtis (Brit. Ent., pl. dxx, 1834).—I place this first in order of precedence in these notes, because if all the five forms here considered be eventually regarded as only conditions of *one species* (which I think probable), the name *ventralis* has the right of priority. The form is especially remarkable for the *ventral surface of the abdomen being black* (excepting at the apex), but with the segmental divisions conspicuously pale during life; the prosternum is partially (or nearly wholly) black or blackish (the colour often forming a Y-shaped marking), and there are usually conspicuous black marks above the insertion of the coæ on the mesosternum. There is occasionally a black point on the basal joint of the antennæ, and in some examples (from England, Holland, France, and the Rhine Valley) I see

two black points on the head posteriorly (compare remarks on *Ch. Zelleri*). The neuration varies in the amount of black and pale. *Ch. centralis* is var. 7 of *aspera* in Schneider's Monograph (p. 112). It is widely distributed, but localized, and, according to my experience, never presents any intermediate conditions in ventral coloration, and on this character one is never in doubt in determining it.

Ch. PRASINA, Burm. (Handbuch, ii [2], 981, 1839).—This ranks next in order of priority, and heads the series of *prasina*, *abdominalis*, *aspera*, and *Zelleri*. Having stated that *centralis* never leaves one in doubt (be its position specific or varietal), we are now confronted with distinct difficulties. Latterly it has been the custom to unite *prasina* and *aspera*, and I have more than once strongly urged their union. Recently I resolved to obtain a sight of Burmeister's type if possible, and placed myself in communication with Dr. O. Taschenberg, of the University of Halle, who took infinite trouble to help me, and lent me what no doubt is the original type, though Burmeister, probably subsequently, appears to have confused *aspera* and *septempunctata* (the specimens bear no labels on the pins). The type may be the specimen figured by Schneider, or the latter author may have used one of the few other specimens to which he refers (Monogr. p. 111). The type is in good condition (but bleached by age), and agrees sufficiently with Schneider's definition and figure, save in one matter, and that is important. The abdomen is not discoloured (which happens too frequently in dried specimens of *Chrysopæ*), and it shows (unless I am very much mistaken) decided indications of the dark markings on either side of the dorsum characteristic of *abdominalis*. The coloration of the neuration agrees with Schneider's description and figure. Schneider points out the totally black transverse neuration, and the two brown lines on the pronotum as especially serving to distinguish *prasina* from *aspera*, the importance of which I fail to realize after an examination of a very long series of the latter; nevertheless, I do not feel sure that I have seen any other specimen *precisely* agreeing with Burmeister's type.

Ch. ABDOMINALIS, Brauer (Neurop. Austr., 61, 1859: a modification of *Ch. abdomine-punctata*, Brauer, Haidinger's Abhandl., iv, 1850, where there is a figure). I place this name in the present sequence for special comparison with *Ch. prasina*. My recent endeavours to elucidate the specific position, or otherwise, of *abdominalis* formed the *raison d'être* of this short memoir. It is to be remarked that Brauer, in his "Neuropteren Europas" (Festschrift, z.-b. Ges. Wien, 1876), in analyzing the Austrian species, says of *abdominalis*:—"Ich halte sowohl diese als auch die vorige Art (*prasina*) nur für Varietäten von *Ch. aspera*, Wsm." The principal point in Brauer's earlier descriptions is the existence of elongate brown markings on either side of the dorsum of the abdomen. I have shown that these apparently exist in the type of *prasina*; I will show later on that they exist in *Zelleri*. In the "Neuroptera Austriaca" we also find allusion to the black commencement of the sector radii, and of the upper cubitus. It is well to remark that I have not seen an actual type of *abdominalis*. At one time I temporarily rejoiced in the discovery of what appeared to be a good character (not noticed by Brauer), but the illusion was soon dispelled. I possess examples from Saxony sent by Rostock as *abdominalis*; I have seen one from the same source, and also from Burgdorf, Switzerland (Meyer-Dür), from Albarda's collection; in 1885 I captured in Holland, and in the Schwarzwald,

isolated examples. Presuming the abdominal markings are present in all of these (they are so in those in which the abdomen is not discoloured), they are peculiar, inasmuch as (with the greatest general resemblance to the type of *prasina*) they agree in having the basal portion of the sub-costa *continuously black for a short space* in both pairs of wings. But Albarda forwarded other examples (from Burgdorf) as probably *prasina*, in which this condition existed only in the anterior-wings.

CH. *ASPERSA*, Wesmael (Bull. Acad. Brux., 1840, 210).—The conditions noticed under *prasina* and *abdominalis* appear to be comparatively rare (not yet noticed in Britain). But excluding these (and *centralis*) there exists a somewhat protean mass of conditions ordinarily grouped under “*aspersa*.” The size varies enormously, so also do the thoracic spots; so also does the amount of black coloration in the neuration, but, as a rule, the transverse nervules are only black at either end; the basal joint of the antennæ has sometimes a black point (= var. 6 of Schneider); and certainly the dorsum of the abdomen is often spotted (but the spots, if I mistake not, are in this case smaller and more numerous than as noticed for *abdominalis*, &c., and do not appear in the very numerous dry examples before me). Allowing for all variations, it is the most common and dominant condition.

CH. *ZELLERI*, Schneider (Monogr., 114, pl. 38, 1851).—The main distinguishing characteristic of this is the presence of two black points on the posterior portion of the top of the head (“*in vertice duobus punctis*,” Schneider). The other characters given by Schneider, such as the dark line on the outside of the basal joint of the antennæ, &c., are certainly variable. It is probably mainly (but not entirely) a meridional condition. Zeller captured it in Sicily, and I have examples from him. I have stated that the two black vertical points sometimes exist in *centralis*. Albarda tells me that in examples of *Zelleri* (from Hyères) there are faint indications of the dark points above the coxae on the mesosternum noticed under *centralis*; these do not exist in any one of the five examples in my collection. But I have an Italian specimen forwarded by Prof. Costa as a type of his *Hemerobius Ramburii* (although it is his *H. neglectus* that should have the two spots on the top of the head, according to his description), which most distinctly shows the abdominal spots as in *abdominalis* (these are not visible on my other examples), and Albarda says they are equally present in his examples from Hyères.

The foregoing is an attempt to elucidate a critical question as to how far variation *may* have been made subservient to specific differentiation, and, if I mistake not, it might be extended to double the length here given. Possibly my ideas may eventually prove to be in part erroneous by a careful examination of *structural sexual characters* in living specimens (I fail to detect such in dry individuals). Moreover, there remains the test of breeding from eggs. The larva would appear to differ from others of the genus by its shorter and broader form, and its habit (Brauer) of covering itself with the skins of the Aphides, &c., it has sucked; a habit common in *Hemerobius*, but possibly not otherwise noticed for *Chrysopa*.

In the absence of any data to the contrary, the subject may at present be closed as follows:—

- (1.) With the exception of the ventral and prosternal peculiarities exhibited in *ventralis*, all other characters seem to be essentially variable and often interchangeable.
- (2.) There appears reason to believe that *all* the conditions may be only varieties of one species, for which the name *ventralis* has the right of priority.
- (3.) Admitting *ventralis* as distinct, the others are varieties of one species, for which *prasina* should be adopted.

In concluding these notes, it remains to me to acknowledge the great assistance I have received from my correspondent Mr. Herman Albarda, of Leeuwarden, to whom I am indebted for help to the extent that some portion of the notice may be regarded as a joint production. It is essentially a critical subject, and one on which I have the highest regard for Mr. Albarda's critical acumen. He was so kind as to look through a preliminary draft of these notes, and I have embodied most of his suggestions; which, moreover, caused me to re-examine my materials, and, in so doing, additional points of importance were discovered.

Lewisham, London :

June, 1886.

ON SOME POINTS OF VARIATION IN *CHRYSOPOA*
SEPTEMPUNCTATA, WESM.

BY ROBERT McLACHLAN, F.R.S., &c.

Chrysopa septempunctata is a widely-distributed species in the limits of the European Fauna, and, though by no means confined to gardens, a common garden insect, and one of the most evil-smelling of its genus. Its specific name is derived from the presence (ordinarily) of *seven* black markings on the face, viz. :—a usually large and often ovate spot between the basal joints of the antennæ, a more or less lunate spot below (or before) each basal antennal joint, a more or less rounded spot on the genæ on either side, and a streak on either side of the clypeus. Excepting differences in the size of individual examples of the insect, the variation mainly concerns these spots on the face. Schneider (Monogr., p. 102) recognised two such varieties, viz. :—

“Duobus punctis nigris ante antennas deficientibus : varietas *quinqe-punctata*, mihi.

Etiam puncto nigro inter antennas deficiente : varietas *quadri-punctata*, m.”

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Of his var. *4-punctata* I have never seen an example; of his var. *5-punctata* I have seen many, and captured a characteristic specimen with my hand in my garden as it was flying here (Lewisham) one evening early in the present month of June.

But the size of the spots (independently of the absence of some of them) varies enormously, especially that between the antennæ and the pair immediately below (or before) the antennæ, and all may be reduced to mere points, or may be very large and conspicuous. In some specimens from Switzerland (Meyringen and Sierre) the spots are very large, and occasionally *the spots on the genæ are connected with the streaks on the clypeus*, forming one enormous spot of irregular form.

In the var. *5-punctata* the spots are usually very small, reduced to points; and I am now of opinion that *Ch. centralis*, McLach., from Turkestan, described by me in Fedtschenko's voyage, can be only regarded as identical with *Ch. 7-punctata*, var. *5-punctata*. As my original description of *centralis* was translated into, and published in, Russian (and, therefore, not to be understood, even by myself), I append a copy of the note attached to the description from the original MS. (which I fortunately preserved).

"The species is clearly allied to *C. septempunctata*, but differs in wanting the black spots below the base of the antennæ, and in the small size of the other black spots. It is also allied to the Japanese *C. cognata*, but that species has no spot between the antennæ. All may possibly be local modifications of *C. septempunctata*."

I am not sure that I have seen typical *Ch. 7-punctata* from Turkestan, but the var. *5-punctata* (*centralis*) has also been received thence from another source, and is in Albarda's collection; it may probably be the dominant condition there.

An example from Eastern Siberia, that I can only refer to *Ch. 7-punctata*, has the spots on the genæ virtually obsolete, but the other spots conspicuous.

It would appear that *Ch. pallens*, Rambur, described from a single example from Spain, and now generally united with *7-punctata*, is really of the var. *5-punctata*, for Schneider says, "stria arcuata ante antennas deficiente." Hagen makes no allusion to the spots in his notes on the type in Stett. Zeitung, 1866, pp. 298, 299.

It is well to allude here to *Ch. bipunctata*, Burm., from Japan, and *Ch. cognata*, McLach., from Japan, China, and Cambodia. According to Schneider's detailed description of the type of *bipunctata* (Monogr., p. 104), the face should have seven spots as in *7-punctata*, the main difference being in the form of the spot below the basal joint of the antennæ, which he defines by "stria arcuata," but the same

definition would apply to the form of these spots in many European specimens of *7-punctata*. I have many specimens of *Chrysopa* from Japan, but not a typical *7-punctata*, nor anything which Schneider's definition of *bipunctata* will suit. Of *Ch. cognata*, McLach., I have many examples. It has all the general form of *7-punctata*, but the spot between the basal joint of the antennæ is totally absent, and there are only four spots on the face, viz. :—one (usually large and lunate) below (or before) the basal joint of each antenna, and a short broad streak on either side of the clypeus (the spots on the genæ being absent).

Lewisham, London :

June, 1886.

Discovery of the Trichopterous genus Calamoceras in Central France.—The genus *Calamoceras* is essentially interesting as being the sole representative in Europe of a section or group of forms otherwise exotic. It was constituted by Brauer (Reise der "Novara") on a damaged ♀ from Gibraltar, which he named *C. marsupus*. Subsequently the late M. Camille von Volxem discovered the genus in South Portugal, and as his examples appeared to be distinct from Brauer's type (a point concerning which there is still need for elucidation), I described them as *C. Volxemi*. The Rev. A. E. Eaton, during his tour in Portugal, found *C. Volxemi* in several localities in some numbers. But the genus appeared to be confined to the Iberian Peninsula.

My valued correspondent, M. René Martin, of Le Blanc (Indre), France, recently sent me a few *Trichoptera*, &c., from his locality, and among them are two specimens of a *Calamoceras*, not in very good condition, which I fail to separate specifically from *C. Volxemi*. This is an exceedingly interesting point in geographical distribution. Originally recorded from the extreme South of Spain, in lat. $36^{\circ} 10' N.$, the most northerly of Mr. Eaton's localities was Villa Real, in about $41^{\circ} 20' N.$ M. Martin's locality, Le Blanc, lies in about $46^{\circ} 35' N.$, nearly in the centre of France, and of course with the Pyrenees intervening between it and the more southern localities. At present M. Martin mainly confines his attention to the Dragon-flies, and from the species that occur with him (and the dates of first appearance), there is evidence that his district has a climate more meridional than its situation would lead us to suspect.—R. McLACHLAN, Lewisham, London : June 12th, 1886.

Kolbia quisquiliarum, Bertkau, a genus and species of *Psocidae* new to Britain.—When in Glasgow last autumn I noticed in the rich collection of Mr. J. J. King, a single example of a species of *Psocidae* which, at that time, I identified as *K. quisquiliarum*. It was taken by Mr. King near Lyndhurst, New Forest, in August, 1879. He recently sent up the specimen, and I was able to confirm my previous identification ; moreover, it has been seen by Herr Kolbe, with the same result. The genus (and species) was first described by Dr. Bertkau in the Verh. pr. Rheinlande, xxxix, p. 129 (1882). He found it in Rhenish Prussia, from June to October ; Herr Kolbe has also found it near Berlin. The genus is allied to *Cecilius*, and the arrangement of the neuration is somewhat similar ; but the pterostigma is more elongate and less dilated. An important character is that the wings of the ♀

are only rudimentary, whereas they are developed in the ♂. The wings have no markings, but the neuration is very strong and dark, and furnished with long hairs. The size about equals that of *C. obsoletus*, &c. The habits are peculiar, as it is found under stones and amongst dry rubbish (hence the specific name), dead leaves, &c. No doubt it only requires searching for in order to be re-discovered in this country; and there are several other recently-described European genera and species of *Psocidae* of somewhat similar habits that no doubt also occur with us.—ID., Lewisham, London : June 16th, 1886.

Caecilius piceus, Kolbe, and *C. Burmeisteri*, Brauer, in Scotland.—I found the two species above named very commonly by beating Juniper during the month of August, near Insh, Inverness-shire; *C. piceus* was very abundant at a spot within a few yards of the village.—JAMES J. F. X. KING, 207, Sauchiehall Street, Glasgow : June, 1886.

Notes upon the capture of Coleoptera during flight.—Amongst the varied methods of capture adopted for *Coleoptera*, the above appears one that is seldom made use of, at any rate by young collectors; and as I have found it yield good results, I thought it might be of interest to mention a few of the conditions conducive to its successful employment.

Any attentive observer of Nature cannot fail to have noticed upon a fine spring or autumn day the immense amount of insects that fill the air. To most persons they appear to be flies, but examined more carefully, they will be found to consist principally of *Coleoptera*, the major portion belonging to two divisions, viz., *Brachelytra* and *Lamellicornia*.

With these, however, many representatives of other groups will be found associated. There will be noticed a very marked dissimilarity of flight, and it is to this point I would draw particular attention; indeed, the various genera appear to possess as distinct an individuality in their mode of flight as in other respects—some darting along with great velocity hither and thither, apparently quite regardless of obstacles; others again, with more deliberation, wheeling round and round in large or small circles, or hovering, as it were, over some particular spot. Broadly classed, the *Adephaga*, *Brachelytra*, and *Lamellicornia* are the swift; whilst members of the *Clavicornia*, *Rhynchophora*, *Longicornia*, *Sternoxi*, &c., are slower and heavier fliers; the *Heteromera*, *Malacodermata*, and *Teredilia* being the hoverers. Of course there are exceptions, but after four years' careful study, the above seems generally the rule.

As in peculiarity of flight, so in time; the various species seem to have special hours. Wind, too, exercises great influence—a warm, slightly hazy afternoon, with a quiet south-west breeze, being the most advantageous; so important, indeed, is it, that upon a sudden change taking place, the effect is instantaneous, and the insects vanish “like the morning mist.” The following list will serve to indicate a few of the species likely to be obtained, together with their times of appearance:—

10 a.m. to sunset, spring: *Amara bifrons*, and many others of the genus; *Trechus rubens*, *obtusus*, and *minutus*, species of *Cercyon* and *Hydradephaga* very abundant.

Brachelytra, examples too numerous to detail, especially, however, *Deleaster*

dichrous; of this I have taken at various times nearly three dozen, always flying, nor have I ever succeeded in finding it otherwise; this species occurs from 5 to 7 p.m. in spring.

About the same time, viz., 5 to 7 p.m., the following have occurred to me:—*Philonthus villosulus*, *procerulus*, *agilis*, *sanguinolentus*, &c., &c.; *Lithocharis ochracea* and *melanocephala*; many species of *Homalium*, &c.; also *Euplectus signatus* and *sanguineus*, *Euthia plicata*, and *Colon angulare* and *brunneum*; these usually fly after 6 p.m., together with *Agathidium nigripenne*, and various others of the section; nor must I omit *Epuraea parvula*, *pusilla*, and *oblonga*, *Rhizophagus dispar* and *cribratus*, *Pediactus depressus*, and *Silvanus unidentatus*, together with many of the *Cryptophagidae*.

Still later, say about 9 p.m., usually in autumn, *Helops atra* and *P. Stephensii*; and a little earlier, about 8, *Salpingus ater* and *castaneus*, *Lissodema Heyana*, *Orchesia minor*, *Halomenus humeralis*, *Lyctus canaliculatus*, &c.

But it is useless extending the list further; what I have named will show, that given a quick eye and a suitable locality (an old wood yard is a fine place), assisted by a small gauze net, many additions can be made to a collection which are rarely otherwise obtainable.—A. RESTON, Park House, Stretford, Manchester: April, 1886.

Aegialia rufa, Fab.—Saturday, June 5th, being a bright, warm day, I went to the Wallasey Sandhills to look for *A. rufa*, and was not disappointed. It appears to be very local, as it is almost entirely confined to one part of the sands. Can any Coleopterist inform me whether it has ever occurred in Britain anywhere, except on the Cheshire coast?—R. WILDING, 40, Downing Street, Liverpool: June, 1886.

Barypeithes pellucidus, Boh., near Margate.—I have lately discovered this species in great profusion upon the shore between Broadstairs and Margate. The first specimens, which I did not recognise at the time, I found beneath stones, generally in couples. After working a few square yards of ground, however, I came upon the beetle in abundance, taking as many as fifteen from one small hole. The majority were lying fully exposed upon the sand, some feigning death, and others leisurely strolling along. How they came to be there I could not find out. I took nearly five hundred in all, and could easily have taken as many again; on passing by the spot three days later, however, scarcely a specimen was to be seen.—THEODORE WOOD, St. Peter's, Kent: June 14th, 1886.

Melanism in Hibernia progemmaria and Diurnea fagella.—Until the spring of this year, I suppose it must be towards twenty years since I went out to collect *Hibernia progemmaria*. For several years, however, in consequence of the number of specimens of the very dark form known as variety *fuscata*, which I had seen and heard of in the district, I had suspected the form had become much commoner than it used to be; so, to satisfy myself on the matter, on the evening of the 2nd of April, and again in the afternoon of the day following, I paid a visit to an elm plantation, bordered on one side with a hawthorn hedge, where I used to find my darkest specimens. The result more than confirmed my suspicion, for the dark specimens were not only in much greater proportion, but considerably darker than I had ever noticed them before. What we used to call "black females" formerly, had always,

so far as I had noticed, a yellowish-brown edging to all the wings, but now many of them were almost sooty-black all over—head, abdomen, and wings, the former pale border being indicated by being of a slightly browner shade than the rest of the wing, though in some that was hardly noticeable. The females in the day time sit on the elm trunks, where it requires close searching to detect them. A ♀ of the ordinary type can be seen readily many yards from the tree on which it may be sitting; but the var. *fuscosa* assimilates so closely to the bark, that one I found at rest in the afternoon, on taking off my eyes to get a box for it, I was some little time before I could detect it again, though within a few inches and directly in front of it all the while. In this plantation I think fully two-thirds of both ♂ and ♀ noticed were *fuscosa*. I have now a batch of full-fed larvae from a very black ♀ I found paired with as dark and unicolorous a ♂ as ever I found; and another lot from several females, but of which I do not know of what form the ♂ parents were, and await the result with great interest as to what proportions of dark and ordinary forms emerge from them.

After such an experience I determined to carry my investigations a little further, and this time on *Diurnea fagella*. I am not so sure about this species as the other, as formerly I was not at all interested in Micros; I am, however, tolerably certain that I used to see the ordinary pale grey form in fair proportion to the dark form on the trees in our woods, and this opinion is fully borne out by Mr. S. L. Mosley of this town (who also agrees with me about the *progenymaria*), with whom I had a talk on the subject. On the morning of Easter Monday, April 27th, and after dark on the following evening, I picked off 120 specimens of *D. fagella*, of which, probably, 50 were females, and out of the lot, two only, one of each sex, were of the pale type, the almost black form being in very large proportion.—GEO. T. PORRITT, Huddersfield : June 14th, 1886.

Protective mimicry in a moth.—Walking up Camberwell Grove the other afternoon, I suddenly became aware of a lovely and perfect specimen of *Smerinthus tiliæ* sitting on the trunk of one of the lime trees about five feet from the ground. It was, to me, so conspicuous on the dark trunk, that I puzzled much over the fact that it must have been there for some time, probably hours, and had evidently been overlooked by all the passing boys, to whom it would surely be a prize, if only for the pleasure of destroying it. At last, when looking about, I found out the reason.

The limes just breaking out into abundance of foliage produce leaves from little buds here and there on the trunks. These leaves nearly always appear *in pairs* and point *obliquely downwards*, so that they form a most curious resemblance to the wings of the moth, are placed at precisely the same angle, and when only half expanded have the same straight costal edge and scalloped margin.

To a casual glance the resemblance is most striking, and a casual glance is all that is bestowed by the majority of passers on anything so unimportant as a tree or its leaves. This instance of protective mimicry is quite new to me, and exceedingly interesting.—C. G. BARRETT, Camberwell Grove, S.E. : May 18th, 1886.

Tephrosia crepuscularia and biundularia.—A friend has just sent me specimens from Derbyshire of the dark grey variety of what I should have called *biundularia* certainly, but they were taken on April 12th and 24th. They are beautiful dark

grey specimens, smaller than ordinary examples of either form, and certainly bearing no more resemblance to one than to the other, but their time of emergence is precisely that of the form or species which we call *crepuscularia* (formerly *laricaria*). If, on account of difference of colouring, we still continue to look upon *crepuscularia* and *biundularia* as distinct species, we shall, for the sake of consistency, be compelled to make one or two more species to admit these grey and blackish forms.—ID.

The male of Formicoxenus nitidulus, Nyl.—In vol. xx, p. 16, of this Magazine, I pointed out that Mons. E. André had shown in his “Species des Formicides d’Europe,” that the male of *Formicoxenus* was still unknown to collectors. Mons. André has, however, in his First Supplement, p. 11, published last October, described the sought-for male, which has been discovered by M. Gottfried Adlerz, and was described by him in his “Myrmecologiska Studier,” Öfv. af Kongl. Vet. Akad. Forh., 1884, p. 43. For the benefit of our English Hymenopterists I therefore give a translation of the chief distinguishing characters of this male, and I fancy that, in all probability, it may be found in many collections mixed with the workers, which it seems so closely to resemble.

Formicoxenus nitidulus, Nyl.—♂. Exactly like the ♀, except the following characters: head more narrowed behind, which gives it a more oval form; mandibles very short, narrow at the apex, which is obliquely truncate, its apical angle projecting in a blunt tooth; ocelli small, but always distinct; antennæ of twelve joints (the worker has only eleven), the scape shorter and thicker than in the ♀, never more than half the length of the flagellum, the basal joints of the latter are longer than in the workers, and the joints of the club are narrower, in fact, the club is not well defined, and might be held to consist of four or five joints; thorax like that of the ♀, but rather longer; no wings or alar articulations; abdomen with the petiole like that of the other sex, and with five segments beyond it, which are slightly narrower than in the ♀ or ♀; genital armature small.

M. André also observes that, according to M. Adlerz, there exists in every colony of *Formicoxenus* a certain number of specimens intermediate in the form of the thorax and in the development of the ocelli and genital organs, between the males and the workers, and that therefore these characters cannot be relied on to distinguish them, but that the number of abdominal segments and antennary joints, as well as the shape of the mandibles, remain constant.—EDWARD SAUNDERS, St. Ann’s, Mason’s Hill, Bromley, Kent: *May 18th, 1886.*

The female of Crabro signatus, Panz.—The male of this rare species is so distinct from all its allies that there is scarcely any chance of its being overlooked, its rounded curved posterior tibiae, and the little spine on the posterior femora at once affording characteristic distinctions, but with the female things are very different. It resembles that sex of *dimidiatus* so closely that it requires a very careful examination to detect its characteristics. There is something in the general build of the insect that makes it look distinct, and yet it is not easy to point out in what the distinction consists. Mr. Harwood has very kindly given me the only female which he has captured at Colchester, where he has also taken the male, and after a careful comparison of it with ♀ *dimidiatus*, the following characters appear to me to be of value in distinguishing it:—

1st. The impressions on the vertex, as observed by Wesmael, are each divided diagonally by a raised line, but I do not fancy that this character is a very reliable one, as in some specimens of *dimidiatus* the origin of such a line can be distinctly traced.

2nd. The posterior tibiae are more rounded and less spinose: in *dimidiatus* there is a sort of crest down the centre of the tibia, from which some of the spines seem to spring; this is much less developed or nearly obsolete in *signatus*, and the tibiae are not marked with black.

3rd. The basal segment of the abdomen is shorter, and its sides converge more rapidly to the base, and so make the waist shorter.

4th. And what seems to me to be the most important character of all, the meta-thorax is shorter, and slopes more abruptly down to the point of junction with the abdomen; it is this character, easily perceived if the insects are examined sideways, which, I believe, gives to *signatus* ♀ its peculiar shape.

I fancy that *signatus* ♀ is very probably mixed in collections with *dimidiatus*, and that it would be discovered in many localities if its distinguishing features were better known.—ID.: June 14th, 1886.

Scottish Hemiptera.—Since the death of Mr. George Norman in 1882, no one appears to have collected *Hemiptera* in Scotland, and yet there is reason to believe that his somewhat desultory though continued attention to this Order, producing as it did a good many rare species, did not exhaust the novelties, and that there yet remain a number of species that are desiderata, even of those that have been found sparsely. Surely among the Scottish entomologists there are some that without any special search find *Hemiptera* it would be very easy to bottle for their friends, if they did not keep them for themselves; this latter, however, if they once began to get them would, I hope, happen. There are a good many species that are mostly or only found in the North; I mention a few of them, but others not now known as boreal will be sure to occur, for it is the unexpected that mostly happens.

HETEROPTERA.

Clinocoris griseus, Linn. (cf. vol. xxii, p. 37), on birches.

Phytocoris pini, Kbm., Scotch fir, August.

Deraocoris alpestris, Fieb., woods, July.

Orthotylus flavinervis, Kbm., on Wych elm (*Ulmus montana*), July and August.

Conostethus brevis, Reut., saline places, August.

Plesiodesma pinetellum, Zett., Scotch fir, June.

Agaliastes Wilkinsoni, D. & S., moss in grass in woods, May, June.

Bothynotus pilosus, Boh., on moors 1500 feet up.

Temnostethus nigricornis, Zett., Scotch fir, June.

Acomporocoris alpinus, Reut., firs, June.

Salda morio, Zett.; *scotica*, Curt.; *conspicua*, D. & S., on elevated moors, June, July.

Corixa venusta, D. & S.; *socia*, D. & S.; *sodalis*, D. & S.; *vernica*, Walleng.; *variegata*, Wall.; *cavifrons*, Thoms.; in mountain lochs and streams, August and September.

C. Boldi, distinguished from all others by the markings on the clavus being longitudinal instead of transverse, it is very desirable to obtain if possible. It is known only by a single example taken in the North of England.

HOMOPTERA.

Acocephalus histrionicus, Fab.

Agallia brachyptera, Boh.

Thamnotettix melanopsis, Hardy; *tornella*, Zett.

Athysanus depressus, Scott; *irroratus*, Scott; *piceus*, Scott.

Orthezia cataphracta, Shaw, and *O. floccosa*, De Geer, the males have been seen alive only by the late Mr. G. Norman; I have but a single poor example, but they are stated not to be rare in September on short grass near Pitlochry.

The above is merely a mention of the names of such species as now occur to me; a full list of Mr. Norman's captures will be found in the Ent. Mo. Mag., xvi, 175 and 213, and xviii, 276.

The following have not yet been found in Britain, but as they inhabit the north of Europe it is very probable they are in the Highlands of Scotland:—

Ommatidiotus dissimilis, Fall., moors, June to September.

Bathysmatophorus Reuteri, Sahlb., on sallow and *Ledum*, June, July.

Triozia acutipennis, Zett., in damp meadows and on spruce firs, May to October.

—J. W. DOUGLAS, 8, Beaufort Gardens, Lewisham: *February 13th, 1886.*

Obituary.

Dr. John Arthur Power died suddenly at Bedford on Thursday, June 9th, aged 76. He was formerly fellow of Clare College, Cambridge, having been a Wrangler, and having obtained a Second Class in the Classical Tripos; he adopted the medical profession, and for about forty years was one of the best known and most successful medical tutors in London, especially in connection with the Examinations for the Indian and Army Medical Departments; while at Cambridge he took up the study of *Coleoptera*; the earliest entry in his journal is "Burwell Fen, June 11th, 1835;" but he had previously (June 2nd, 1834) been elected a Member of the then one-year-old Entomological Society of London; his connection with the Society was, however, not of long duration. Apparently, however, he did not begin to collect regularly until 1853, from which year up to 1880 he was one of the most energetic and successful of British collectors. He found a large number of species new to the British lists, and many species that had been considered extremely rare he discovered in numbers; he seemed to have an instinctive faculty for finding localities, and an intuitive insight into the habits of the species. By his persistent and patient observation he often succeeded in taking large numbers of a beetle which another collector might have searched for in the same locality a short time before, and not found a trace of. His perseverance was only equalled by his generosity; he was always ready to give away specimens of even his rarest captures, and friends that he knew well were always at liberty to select where they liked from his abundantly filled series of insects, which he seemed to have taken and set for their especial benefit.

Dr. Power was induced by Mr. Douglas to collect *Hemiptera*, in which Order he was, as might have been expected, very successful, and he added many species to those hitherto known as British.

About five years ago he was disabled by a paralytic stroke, and went to live at Bedford. As he was unable to continue active work in entomology, he turned to

gardening, and the pleasure and interest he took in his flowers was quite as keen as that which he had taken for so many years in his insects. His intellect was as bright as ever to the last, and although he had not perhaps examined particular species for years, he could tell the minute differences between them, and the very spot where, and conditions under which, he took his specimens ; in fact, he took as great an interest in entomology as ever, and the sight of an entomological friend was always welcome to him. He was apparently quite well on the night before his death, but next morning was taken suddenly ill, and soon after died ; he was buried in Bedford Cemetery on June 12th. His death leaves a gap in the ranks of British entomologists which it will be almost impossible to fill. In the words of one of his oldest friends, to whom the writer of this notice is indebted for a portion of the information contained in it: "We have had many good collectors, and some that knew more of entomological science and literature than he, but he was altogether *sui generis*, and we shall never have another Power."—W. W. F.

ENTOMOLOGICAL SOCIETY OF LONDON, June 2nd, 1886 : R. McLACHLAN, Esq., F.R.S., President, in the Chair.

The following were elected Fellows, viz. :—Messrs. C. Baron Clarke, M.A., F.R.S. (formerly a Subscriber), H. Wallis Kew, of Louth, W. Daniell, of Greenwich, J. P. Mutch, of Hornsey Road, N., Wm. Warren, of Cambridge, B. W. Neave, of Browneswood Park, N., and A. C. F. Morgan, of Oporto.

The death of Mr. F. E. Robinson, one of the Fellows, at the early age of 26, was announced. He was formerly a pupil of Prof. Westwood, at Oxford, and was killed by a tiger in India on April 27th.

Mr. S. Stevens exhibited an example of *Heydenia auromaculata*, Frey, from the Shetlands, a species new to Britain, noticed by Mr. Barrett in the Ent. Mo. Mag., vol. xxiii, p. 13, together with *H. flavimaculella*, for comparison.

Dr. Sharp exhibited certain specimens of *Staphylinidae*, prepared by him a long time ago with a special view to their permanent preservation. They were placed in cells of cardboard, open above and below, or above only, and sealed up by successive layers of bleached shell-lac. The President said the plan appeared to be very successful where the cells remained transparent ; in other cases the preparations were open to the obvious objection that only one surface of the insect could be examined.

Mr. Billups exhibited *Meteorus luridus*, Ruthe, a species of *Ichneumonidae* new to Britain, bred by Mr. Bignell from a larva of *Noctua brunnea*.

Mr. White, in exhibiting cocoons of *Cerura vinula*, called attention to the vexed question as to how the perfect insect escapes from these solid structures. He was inclined to think that formic acid, secreted by the insect, was a probable factor in the operation. The question also involved that of how do the parasitic *Ichneumonidae* and *Diptera* escape ? With regard to the latter question the President remarked that larvae infested by parasites possibly constructed their cocoons to serve the requirements of these parasites. Baron Osten-Sacken, Mr. Waterhouse, Prof. Meldola, and others, joined in the discussion.

Mr. Elisha exhibited living larvae of *Geometra smaragdaria* from the Essex marshes. He also exhibited the singular pupae of *Agdistis Bennetii*.

Mr. Howard Vaughan exhibited a series of several hundred bred specimens of

Peronea Hastiana, shewing the innumerable varieties, and the tendency of these varieties to connect. As they were obtained from collected larvae it was impossible to state to what extent the variation might be hereditary. He also exhibited, on behalf of Mr. Sidney Webb, of Dover, an interesting series of *Cidaria suffumata*, with especial regard to the progeny of particular females, the parent, and the produce of the eggs laid by her being carefully separated. Mr. Vaughan also read notes on the subject communicated by Mr. Webb, and Messrs. Weir, Waterhouse, Stainton, Sharp, Distant, and others, took part in the discussion that ensued.

Mr. A. G. Butler communicated a paper on "New genera and species of Heterocerous *Lepidoptera* from the Australian region," in which 21 new genera and 103 new species were described.

Mr. J. S. Baly communicated a paper on "Uncharacterized species of *Diabrotica*."
—H. Goss, *Secretary*.

THE SCYDMÆNIDÆ OF JAPAN.

BY D. SHARP, M.B., F.Z.S.

Twelve years ago I described, in the Transactions of the Entomological Society of London, five species of this Family. These were the first *Scydmænidæ* known from Japan, and no others have yet been added to them. I am now enabled to bring the number of species up to fifteen, all of which have been discovered by Mr. George Lewis. Nothing is yet known of the *Scydmænidæ* of China, and as the Japanese members of the Family have but little close relationship to those of Europe, it appears at present that all are peculiar to the islands. When I wrote twelve years ago the genera were not in a very well defined condition, but since then they have been greatly improved by the labours of Reitter, and *Euconnus* may be accepted as distinct, as well as *Eumicrus*, although Schaufuss (who has been one of the most extensive describers of this Family) is still of a contrary opinion as to *Euconnus*.

1. EUCONNUS IMPAR, sp. n.

Convexus, rufescens, nitidus, thorace parum hirto, capite elytrisque nudis; antennis sub-gracilibus, clava quadriarticulata; thorace sub-oblongo, haud impresso; elytris inter suturam et humerum impressione subtile longitudinale. Long. 1½ mm.

Joints 3—6 of antennæ slender and almost similar, 7th rather longer, longer than broad, 8th to 10th larger, sub-equal, each about as long as broad, the first of them being, however, rather more slender, terminal joint acuminate, slightly longer. Head broad, eyes small, placed quite in front; palpi elongate. Thorax longer than broad, bearing much pubescence, quite destitute of punctures or foveæ. Elytra rather narrow, slightly broader at the base than at the thorax, without humeral fold, but with a small longitudinal depression rather nearer to the suture than to the shoulder.

The male has the anterior femora much dilated, so as to form an arcuate upper margin.

Found sparingly in several localities; Yokohama, Nügata, Nagasaki, in spring and autumn.

2. EUCONNUS DULCIS, *sp. n.*

Minus convexus, rufescens, nitidus; antennis sub-gracilibus clava quadriarticulata; capite estringue dense hirsuto; thorace sub-quadrato, basi sulcula transversa estringue foveolata; elytris laxe pubescentibus, basin versus sub-deplanatis.
Long. vix 1½ mm.

Antennæ with joints 3—6 equal, 7th larger, almost intermediate in size between the 6th and 8th, so that the club is not abrupt, this consists of four sub-equal joints, each about as long as broad. Palpi with quite slender pseudo-terminal joint. Head broad, with a tuft of dense hairs on either side behind the eye. Thorax about as broad as it is long, its pubescence rather scanty, with a well-marked fovea on each side, and a finer channel between and connecting them. Elytra rather flat at the base, a little distance within the shoulder with a rather deep depression, not punctate, but with a scanty, fine, long pubescence. Tibiæ very slender. Mesosternal lamina very erect, very slender.

Nagasaki; four examples.

3. EUCONNUS DEBILIS.

Scydmænus debilis, Sharp, Tr. Ent. Soc. Lond., 1874, p. 127.

Very distinct by the three-jointed club of the antennæ. Also rare; but a single example was procured at Kioto July 4th, 1881.

4. EUCONNUS JAPONICUS.

Scydmænus japonicus, Sharp, *l. c.*, p. 127.

This is also a *Euconnus*, though peculiar, owing to the small head and the comparatively large eyes; taking, however, the structure of the anterior part of the head and the insertion of the antennæ as the criterion of the genus, and not the distance of the eyes from the neck, there can be no doubt of the systematic position of the insect. It has not been met with since Mr. Lewis' first visit.

5. EUCONNUS FUSTIGER.

Scydmænus fustiger, Sharp, *l. c.*, p. 128.

This, too, is a *Euconnus*, allied to the following; it is apparently rare, as it has been met with near Nagasaki in the spring on three occasions, each time in a single example.

6. EUCONNUS LEWISII, *sp. n.*

Angustulus, breviter, dense pubescens, fusco-rufus, elytris magis rufescentibus, antennis pedibusque testaceis, illis clava breve perabrupta, quadriarticulata; prothorace conico, haud impresso.
Long. 1½ mm.

Antennæ short, with remarkably abrupt, broad, four-jointed club, each articulation of which is transverse. Palpi with rather broad and short pseudo-terminal joint. Head narrow and elongate, very densely pubescent, vertex much prolonged.

Thorax longer than broad, densely pubescent, sub-conical. Elytra slender, convex, much narrowed towards the base, rather densely clothed with a short fulvous pubescence, with a very slight depression within the shoulders. Pectoral lamina excessively elevated, broad.

This forms one of a little group of species characterized by the peculiar antennæ, that I think may prove peculiar to Japan, at any rate, I am not myself acquainted with any other *Euconni* having so abrupt, short and broad a club to the antennæ. *E. fustiger* is closely allied to the present species, but has a quadri-foveolate thorax, and a much larger depression at the base of the elytra.

Nagasaki; six examples found in the early spring of 1881.

I have named this species in honour of the naturalist to whom we owe so much for his entomological work in Japan.

7. EUCONNUS BAUCUS, sp. n.

Convexus, breviter, dense pubescens, piceus, antennis pedibusque testaceis, illis clava breve perabrupta, quadriarticulata; prothorace conico, haud impresso.

Long. 1 $\frac{1}{4}$ mm.

This is closely allied to *E. Lewisii*, but is larger and broader, and the depression at the base of the wing-cases is larger, the humeral fold being longer and placed nearer to the outside, and there being feeble signs of two other depressions at the extreme base between this and the suture.

Nagasaki, March 26th, 1881; unique.

8. EUCONNUS OSCILLANS, sp. n.

Parvus, rufo-testaceus, pubescens, antennis brevibus, clava abrupta sat lata, quadriarticulata; prothorace conico-subquadrato, ante basin vase transversim depresso; elytris laxe pubescentibus, minus subtiliter punctulatis. Long. 1 $\frac{1}{4}$ mm.

Joints 3—7 of antennæ small, about equal, the next three joints transverse, but not strongly so, terminal joint about as long as broad. Head narrow, vertex much prolonged. Thorax without sulcus or fovea, but with an indistinct depression in front of the base. Elytra with a definite distinct punctuation, and with a scanty, rather long pubescence, only indistinctly depressed within the shoulders.

Only one example has been met with, and the description therefore is not very good, as I cannot form a good opinion as to the exact shape of the thorax, and the clothing of the head, the former being concealed by the rough pubescence, and though there is little pubescence on the head, the surface appears dull and rough as if such had been present. The species, however, is abundantly distinct, as it resembles *E. debilis*, but has a four-jointed club to the antennæ; it is different in form and appearance to the *E. Lewisii* group of species, has a much less broad antennal club, and a fine pectoral lamina.

Hitoyoshi, May 3rd, 1881; unique.

SCYDMENUS POLLENS, sp. n.

Convexus, longius pubescens, rufo-castaneus, antennis palpis pedibusque rufis; elytris fortiter punctatis. Long. 2 mm.

Antennæ thicker towards the extremity, the penultimate three joints very evidently transverse. Thorax small in proportion to the elytra, about as broad as long, distinctly narrowed behind, with indefinite transverse depression in front of the base, the basal portion being punctate. Elytra oval, convex, with upright pubescence, and remarkably distinct coarse punctuation, basal depressions quite indistinct.

This is allied to our *S. Godarti*, though abundantly distinct; it is larger, with the outer joints of the antennæ thicker, the punctuation of the elytra remarkable, and their basal foveæ very obscure.

Oyayama, April 26th, 1881; unique; the front femora are incrassate, so that the example is no doubt a male.

EUMICRUS.

A. Middle coxæ separated only by a sharply raised carina.

1. EUMICRUS VESTITUS.

Sharp, Trans. Ent. Soc. Lond., 1874, p. 126.

This species is well distinguished by the remarkably large size, and the approximation of the two more inner of the basal foveæ. It has, as yet, been found only in Nipon and Kiushui; though as it is allied (but by no means closely) to the European *E. tarsatus*, we may feel sure it is to be found also in the northern parts of the Archipelago.

2. EUMICRUS ANGUSTUS, sp. n.

Angustulus, convexus, parce pubescens, rufo-brunneus, antennis pedibusque testaceis; prothorace elongato haud lato, basi foveolis quatuor parvulis sed profundis instructo: elytris obsolete punctatis. Long. 1½ mm.

Antennæ rather elongate, with long three-jointed club, the 9th and 10th joints each quite as long as broad, the terminal joint longer. Head rather narrow, a little narrower behind. Thorax slender, longer than broad, curvate at the sides, the greatest width in front of the middle, a little narrowed behind, at the base on each side with two distinct approximate foveæ. Elytra rather narrow, convex, with short humeral fold limiting a short basal depression.

This is an ordinary *Eumicrus*, the middle coxæ being separated only by a sharply raised slender carina.

Kioto, July 4th, 1881; unique.

3. EUMICRUS CURTIPENNIS, sp. n.

Latiusculus, sat convexus, rufo-brunneus, minus subtiliter pubescens; prothorace posterius angustato, basi utrinque obsolete bifoveolato; elytris subtiliter punctulatis.

Digitized by Google Long. 1½ mm.

Antennæ stout, club broad, three-jointed, 9th and 10th joints transverse, terminal not longer than broad. Head transversely sub-quadrata. Thorax rather short and broad, its greatest width very near the front, much narrowed behind, almost impunctate, the basal foveæ very obsolete, placed one near the outer angle and one just outside it. Elytra unusually short and broad, with well-marked pubescence and only a feeble punctuation.

This is intermediate between the ordinary *Eumicri* and the peculiar species forming the next group; the mesosternum is only feebly carinate, but the middle coxae are not more distant than usual.

Ichinchi and Hitoyoshi, commencement of May, 1881; two examples.

B. Middle coxae more largely separated, mesosternum ecarinate.

4. *EUMICRUS CIBRATUS, sp. n.*

Sat convexus, subtiliter pubescens, pallide rufus; prothorace elongato, posterius angustato, fere impunctato; elytris crebre fortiter punctatis. Long. 1½ mm.

Antennæ rather small, club slender, three-jointed, 8th joint very small. Head transversely quadrate, not punctate. Thorax longer than broad, its greatest width much in front of the middle, strongly narrowed towards the front and much narrowed behind, without impressions. Elytra rather coarsely and closely punctate.

Allied to *E. reversus*, but readily distinguished by the nearly impunctate thorax.

Sapporo, Kashiwagi, June 15th, 1881; five examples.

5. *EUMICRUS REVERSUS.*

Scydmænus reversus, Sharp, Tr. Ent. Soc. Lond., 1874, p. 128.

Mr. Lewis has now found a small series of this remarkable little insect; the peculiar pygidial structure described by me (*l. c.*) proves to be peculiar to the male sex, the pygidium in the female being normal. The structural characters previously given by me are mostly such as are now recognised as characteristic of *Eumicrus*, the mesosternal structure is, however, not that normal in the genus mentioned, but it would be superfluous to institute a new genus on this account at present.

Found in thatch at Ipongi, March 31st, 1881; at present only taken in the Nagasaki district.

CEPHENNIUM JAPONICUM, sp. n.

Rufo-piceum, longius minus subtiliter pubescens, antennarum clava crassa, hand abrupta, triarticulata. Long. 1½ mm.

Joints 3—7 of the antennæ are small, the 8th very evidently larger, the club is

large and increases in width to the terminal joint. Thorax strongly transverse, as broad as elytra, the sides behind with a slightly elevated broad margin, the surface is finely punctate, and there is a fovea near each hind angle. The elytra are roughly pubescent and punctate, and there is an elongate, very fine, humeral plica. The middle coxae are very distinctly separated.

Nagasaki; four examples.

Southampton: *March*, 1886.

NOTES TOWARDS THE LIFE-HISTORY OF *SCENOPINUS*
FENESTRALIS.

BY C. R. OSTEN-SACKEN, HON. F.E.S.

[The "Canadian Entomologist" for April, 1886, contains a short article by Dr. Hagen: "The probable food of the larva of *Scenopinus*," which records an observation of Prof. Putnam, who found this larva under a carpet, near an empty case of a clothes-moth. Dr. Hagen asks himself whether the larva of *Scenopinus* does not destroy that of the clothes-moth, in which case it would prove a very beneficial insect.

Several years ago I had prepared an article on the same subject, which remained, however, among my unpublished manuscripts. As I arrived at the same conclusion as Dr. Hagen, and as the literature on the subject is a little more developed in my article, than in his, I deem it worth while to publish it here.]

I have often wondered what the history of that demure little fly could be which keeps so steadily to our windows: Schiner (Fauna Austr., I, p. 159) observed that although the windows stood open for hours every day, specimens of *Scenopinus* would remain on them and die on the window-sill. That the views on the habits hitherto entertained are not correct, I take for certain. Bouché (Naturg., etc., p. 46) found the larva in decaying tree-fungi. Dufour (Ann. Soc. Entom., 1849) found only the pupa, of which he gives a figure. Haliday, on the strength of these observations, called the larva saprophagous (Halid., on certain rem. blanks, &c.). Asmuss (Stett. Ent. Zeit., 1863, p. 401) found it in ripe strawberries, and describes the pupa as enclosed in a *light cocoon*, a statement which renders the observation doubtful. Frauenfeld (Verh. Zool. Bot. Ges., 1863, p. 65) criticises these statements, and gives a detailed description of larva and pupa; the larva was found among horse-hair in a mattress, and was brought to maturity by being kept among horse-hair, which Frauenfeld, for this

reason, takes to be its food. Loew (Verh. Zool. Bot. Ges., 1861, p. 395) found the larva in a swallow's nest, and took it for that of *Thereva*, a statement which Frauenfeld, *l. c.*, corrects, no doubt, with good reason. Damianitch (Verh. Zool. Bot. Ges., 1865, p. 237) found a cocoon of *Saturnia pyri*, inside of which, among remains of the pupa, he discovered a chrysalis; he bred *Scenopinus niger* from it; he gives a good figure of the chrysalis, which, he says, agrees in the main with the figure previously given by L. Dufour of the chrysalis of *Sc. fenestralis* (the differences are probably specific). Packard (Proc. Essex Institute, 1867, p. 93) gives a rough figure of the larva, which, he says, was found feeding on carpets. V. Heyden bred *S. niger* from dry, rotten wood (Jaennicke, Berl. Ent. Zeit., 1867, p. 78). Perris (Insectes du pin maritime, Diptères; Ann. Soc. Ent., 1870, p. 226) found larvæ and pupæ in a branch of *Crataegus*, which contained larvæ of *Ptinus germanus*, and in pine boards, containing larvæ of *Hylotrupes bajulus*; he observed a larva of *Scenopinus* devouring a chrysalis of *Hylotrupes*; he also quotes an observation of Dr. Cartereau, who found in a swallow's nest a pupa of *Lucilia dispar*, containing the imago of a *Scenopinus*, which had died in the effort of escaping from it; Perris concludes by saying, that "this larva, like that of *Thereva*, feeds on animal substances, that is animal dejections or exuviae, and that it is even carnivorous." Mr. C. O. Waterhouse exhibited at the Entomological Society a *Sc. fenestralis* bred from the root of *Aconitum* (Proc. Ent. Soc. Lond., December 7th, 1881; Ent. Mo. Mag., January, 1882).

It seems to me that Perris might have stated more boldly that the larvæ of *Scenopinus*, like that of *Thereva*, *is* carnivorous. This is the result which I obtain from the comparison of all the previous observations. The larva does not frequent fungi, rotten wood, swallows' nests, &c., for the sake of vegetable matters, or animal remains, but for the sake of the pupæ, and, perhaps, also of the larvæ, which it finds there. And I deduce from this that when it occurs in carpets and horse-hair it is not because it feeds on them, but because it hunts there for the larvæ or pupæ of the moths or other insects that live in them.

The long, serpentiform, white larva, very hard to the touch, and very tenacious of life, has several times been brought to me, but it did not occur to me at that time to feed it on larvæ or chrysalides of moths. It might be worth while to try the experiment, and thus to prove that the demure little fly is, after all, a useful member of our household.

CAPTURE OF *EUCNEMIS CAPUCINUS*, AHRENS, A GENUS AND SPECIES NEW TO THE BRITISH LIST.

BY H. S. GOEHAM, F.Z.S.

On Wednesday, July 7th, at the meeting of the Entomological Society, specimens of *Eucnemis capucinus*, a beetle new to the British Fauna, of more than usual interest, were exhibited by me, and some remarks upon the capture, and on the larva of the species were read by Dr. Sharp. A short notice of this addition to our collections will perhaps be interesting to your readers. The insect was discovered in the wood of a partially decayed beech-tree near Brockenhurst, by Dr. Sharp, Mr. G. C. Champion, and myself on the 12th of June, at which time they were apparently freshly emerging from the pupa, some of the beetles being found in the latter state with a very few larvæ. They had formed a colony which had endured for many years, the dead remains of former generations being there.

The family *Eucnemidæ* to which the genus belongs is a remarkable one, of which *Eucnemis* is a typical member, *Microrhagus* and *Melasis*, the other two genera comprised in our list, being aberrant. With the general appearance of a small black *Elater*, *Eucnemis capucinus*, Ahrens, combines several of the characters of the *Throscidæ*. Among the more remarkable of these may be noticed the broad serrate antennæ which are received into grooves on each side of the thorax; the very retractile structure of the legs, and especially of the hind legs, the femora and tibiæ of which in repose are quite concealed by the coxæ; the silky smooth surface of the under-side of the body; and, above all, the depressed and reflexed front of the head, which is carinate, and of which the epistome, or portion immediately above the mouth, meets the anterior margin of the prosternum, completely closing and covering the mouth and its organs. Dr. Sharp ascertained that the insect possesses the power of springing, when turned on its back, to a considerable degree; one brought home alive, which he showed me, thus sprung at least an inch high.

Eucnemis capucinus is not uncommon on the continent of Europe, and considering that we found it in some numbers, it seems only remarkable that it had hitherto escaped the vigilant search of the numerous Coleopterists who, since Stephens' days, have visited the New Forest. We have secured enough specimens to supply most of the collections with a representative. Is it too much to hope that "*requiescat in pace*" may be allowed to be the epitaph over what remain till the returning season has given time for a fresh brood to be matured?

Shirley Warren, Southampton:
July, 1886.

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TROPICAL AFRICAN COLEOPTERA; CHIEFLY FROM THE
ZANZIBAR MAINLAND.

BY H. W. BATES, F.R.S., &c.

(Continued from page 13).

Sub-fam. *OODINÆ.*

SPHÆROODES IMPUNCTATUS, sp. n.—*S. striato*, Dej., Chaud., *simillimus sed differt striis simplicibus, etc.* *Ovatus, convexus, niger politus thorace castaneo, palpis melleo-flavis, antennarum articulis 1—3 pedibusque testaceo-rufis: thorace margine basali late arcuato angulis posticis acutis, toto lœvi: elytris acute striatis interstitiis planis, stria 1^{ma} et 2nd basi conjunctis ibique absque foveola, striola scutellari haud impressa seriatim punctulata.*

Long., 8 mm., ♂.

Ribé, near Mombas (*Mr. Wakefield*).

Differs from the only other described species in the sharply-incised and fine impunctate striæ, the absence of an umbilicated puncture at the junction (at the basal fold) of the 1st and 2nd striæ and in colour; the thorax being dark reddish-castaneous, and the palpi and legs pale: the under-side of the body is more or less reddish-piceous.

Sub-fam. *ANCHOMENINÆ.*

MEGALONYCHUS SCULPTILIS, sp. n.—*M. rugicollis*, Laferté, *affinis*. *Robustus, niger nitidus, palpis antennis et tarsis testaceo-rufis; capite lœvi: thorace magno, orbiculari sed postice magis quam antice angustato, angulis posticis nullis, medio basi sinuato, disco discrete, lateribus rugoso-punctatis; elytris prope apicem profunde et longe sinuatis, angulo suturali obtuso, profunde striatis vel sulcatis striis crebre punctatis interstitiis vix convexis 3^{io} tri-vel quadrifoveolato 7—9 confuse punctatis.* Long., 15 mm., ♂.

Mpwapwa (*Mr. Last*).

MEGALONYCHUS EXCISUS, sp. n.—*M. rugicollis*, Laf., *affinis*. *Niger, ♂, nitidus, ♀, opaca, antennis basi palpis pedibusque obscure rufo-piceis: thorace magno late ovato angulis posticis nullis, disco fere lœvi lateribus rugoso punctatis explanato-reflexis: elytris elongato-oblongo-ovatis apice profunde parum oblique sinuatis, angulo suturali rotundato, striis acute incisis crebre punctatis, interstitiis planis 3^{io} tripunctato, exterioribus et margine explanato punctulatis.* Long., 14 mm., ♂ ♀.

Mamboia (*Mr. Last*).

This and the preceding species are of more elongate form, with the elytra relatively longer, than *M. rugicollis*, Laferté, and the sutural apex is destitute of the tooth-like prominence which distinguishes *M. rugicollis*. The outline of the thorax is very similar, and the base of the elytra is arcuated on each side with obtuse humeral angles.

The sides of the sternal plates and basal ventral segments are more or less coarsely punctured. *M. obscurus*, Chaudoir, which belongs to the same sub-group of the genus, is distinguished by the black basal joints of the antennæ, and a puncture at the apex of the first elytral interstice; *M. platyderus* (another allied species) by the truncated base of the elytra and the hind angles of the thorax indicated by an obtuse dentiform prominence. Both *M. sculptilis* and *M. excisus* are distinguished by the remarkably deep sub-apical sinuation of the elytra, the anterior angle of the sinuation, though rounded, being prominent and conspicuous, and also by the large circular, sometimes umbilicated, punctures of the third elytral interstice.

MEGALONYCHUS SWAHILIUS, sp. n.—*M. rugicollis affinis, sed multo gracilior: piceo-niger, palpis antennis basi pedibusque piceo-fulvis (trochanteribus pallidioribus): thorace angustiori et postice magis angustato angulis posticis obtusissimis sed distinctis margineque ante angulum leviter sinuato, punctato-rugoso disco fere lœvi: elytris sat anguste oblongis, apice oblique et mediocriter sinuatis, angulo suturali haud dentato, margine basali utrinque angulatim sinuato, striis acute incisis crebre crenato-punctulatis, intersticiis fere planis, subtiliter alutaceis (♂) sed sericeo-nitidis, 3^o bipunctato: prosterno lœvi meso- et metasternis extus disperse punctulatis.* Long., 11 mm., ♂.

Mamboia (*Mr. Last*).

Sub-fam. *PTEROSTICHINÆ*.

ABACETUS WAKEFIELDI, sp. n.—Ad. Sect., I, 2, A, b, Chaud. Monogr., pertinet. *Magnus, piceo-niger nitidus; thorace impunctato subrotundato antice et postice fere equaliter angustato, margine laterali incrassato valde reflexo intus sulco marginato, sulcis basalibus profundis; elytris oblongis simpliciter sat profunde striatis intersticiis parum convexis; corpore subtus impunctato.* Long., 15 mm., ♂ ♀.

Ribé, near Mombasa (*Mr. Wakefield*).

The sub-group of Chaudoir's Monograph of *Abacetus*, to which this species belongs, contains those species in which the four hinder tarsi are pluri-sulcate, the front tibial spurs and male fore femora simple, and the thorax rounded on the sides. In the present species the sides of the thorax describe an arc, from the anterior to the posterior angles, but the latter are distinct though obtuse. In its widest part the thorax is scarcely narrower than the elytra, and its lateral margins form a rim which becomes broader as it approaches the hind angles, and is separated from the disc of the thorax by a broad groove (not widened near the base), separated from the disc by a faint fold, which is continued, at an angle, along the base of the thorax on each

side as far as the basal sulci. In this peculiar sculpture of the thorax the species resembles *A. loricatus*, from Guinea, which, according to Laferté's description, differs from ours in its duller surface and punctate-striate elytra.

ABACETUS CAMERONUS, sp. n.—Ad. Sect., I, 2, A, c, Chaud. Monogr., pertinet: *latus, niger nitidus, palpis antennis et pedibus piceo-rufis: thorace transverso medio dilatato, antice subrecte, postice sinuatim, angustato, angulis anticis prominentibus acutis, posticis fere rectis, margine laterali postice incrassato a disco sulco angusto separato: elytris relative brevibus, basi utrinque arcuatis, convexis profunde et acute striatis striis laevissimis: corpore subtus laevi, episternis posticis brevissimis.* *Long., 12—14 mm., ♂ ♀.*

Mount Cameroons.

A handsome species; allied to *A. grandis*, but very different in the proportions of the elytra to the thorax, and distinguished further by its glossy surface and red legs. The elytra are only twice the length of the thorax, and are rounded on the sides and narrowed behind gradually to the apex. The hind angles of the thorax are almost obtuse-angled; the anterior angles are remarkably acute and produced.

ABACETUS LEISTOIDES.—*A. camerono affinis sed facies talde diversa. Elongato-oblongus, niger nitidus, palpis antennis pedibusque obscure piceo-rufis: thorace transverso quadrato-cordato, angulis posticis rectis, margine laterali postice haud incrassato, intus a disco sulco angusto et profundo separato: elytris elongato-ovatis profunde simpliciter striatis: sternis impunctatis.* *Long., 11 mm., ♂ ♀.*

Gaboon.

Belongs to the same sub-group as *A. cameronus*, but of the ordinary elongate oblong form of the *Abaceti*, and somewhat resembling *A. atratus*. The lateral marginal rim of the thorax is thickened, but not dilated posteriorly, and its accompanying groove is equally uniform in width, and unusually deeply incised. The thorax is impunctate, much broader than long, broadly rounded before the middle, and rather strongly narrowed and sinuated to the base, the posterior angles being rectangular and sometimes prominent. The metathoracic episterna are a little broader than long.

ABACETUS NYASSE.—Ad. Sect., I, 2, A, c, Chaud. Monogr., pertinet: *angustus, niger nitidus, palpis, antennis articulo primo tarsisque rufo-piceis: thorace rotundato-quadrato, lateribus arcuatis mox ante angulos posticos sinuatim, margine haud incrassato sulco haud profundo a disco separato, medio basi rugoso-punctato: elytris anguste oblongis, acute striatis interstitiis planis prope apicem convexis.* *Long., 9 mm.*

Lake Nyassa (*Mr. Cotterill*).

A small narrow species resembling an *Argutor*. The thorax is broader than long, with rounded sides, sinuated only just before the slightly projecting hind angles. The lateral rim of the thorax is not at all thickened, and its accompanying groove is of equal width throughout, and delimited from the disc by a fine fold. The posterior episterna are decidedly longer than broad.

(*To be continued*).

ENTOMOLOGICAL LOCALITIES NEAR LIVERPOOL.

BY JOHN W. ELLIS, L.R.C.P., F.E.S.

Some of the readers of the Ent. Mo. Mag. will, doubtless for the first time, be visiting Liverpool during the ensuing two months, attracted thither by the Liverpool Exhibition, and in the interest of such strangers to the neighbourhood the following notes have been penned as a "guide" to those localities within a moderate distance of the city which are of interest to the practical entomologist.

The geological formation upon which the city of Liverpool and its immediate neighbourhood, both in Lancashire and Cheshire, rests, is that of the trias or new red sandstone, the characters of which are well shown in the cuttings leading to the Lime Street and central railway stations, but above this rock there exists throughout the greater portion of the district a layer, variable in depth, of cold, tenacious, boulder clay, containing glacier-grooved stones and many species of sea-shells almost, if not quite, identical with those at present living in the Irish sea. As may be expected from a geological formation so unproductive of peculiar forms of plants, the insects of the district are not of a very striking character, except where the surface of the country has undergone some departure from the ordinary condition, such as has occurred in three distinct forms, viz: the tract of sand-hills which stretches from the Ribble to the Mersey (Lancashire), and, again, from the Mersey to the Dee (Cheshire); the elevated ground in that portion of Cheshire which lies between the rivers Mersey and Dee, where the sandstone appears at the surface, without any clay covering, and where the prevailing plants are the heaths and gorse, such localities as Bidston and Prenton Hills; and, thirdly, the tracts of moss-land, fast alas! disappearing through cultivation, parts of the original Chat moss over which the railway is carried between Manchester and Liverpool. These localities may now be treated *seriatim*, only those insects being noticed which are of special interest.

Lancashire coast sandhills.—These may be easily reached from the Liverpool exchange station (L. and Y. Railway). Perhaps the best place to go to is Hall Road, though there are not many trains that stop at this roadside station. Here the sandhills come directly up to the station, while at Crosby, the preceding station, which offers the advantages of trains back to town nearly every half hour, houses are growing so rapidly that one has a quarter of an hour's walk before one can commence collecting. No directions are needed for finding the way from either place, except that the railway line should not be crossed, that is, the sea side of the line only should be worked.

By rambling about up the hillocks of sand (held together by the "marram" or "star-grass," for destroying which there is provided a penalty), and searching among the low growth of dwarf sallow, &c., in the intervening hollows, many beetles and representatives of other Orders of insects may be found, which are not of general distribution. Wherever there is an overhanging bank formed by the matted roots of the star-grass, this should be shaken pretty roughly, and nocturnal *Lepidoptera* of various species will be shaken out, and will lie—except the day be very sunny—quite still, waiting to be boxed. Such species as *Mamestra albicolon* (June and July), *Agrotis tritici* and *aquilina* (August), *Agrotis cursoria* (August), *Agrotis precox* (August), may be obtained in this way, often in abundance, while, if the ragwort flowers be examined after dark with a lantern, they will often be found *swarming* with the same species of *Agrotis*, to which may be added *Agrotis nigricans*, often nearly black, *Leucania conigera*, *Hydractia nictitans*, *Cidaria testata*, and several species of *Eupithecia*. The larva of *Cerura vinula* may frequently be found about the beginning of August on the small willows which grow in the neighbourhood, while those of *Orgya fuscocincta* and *Bombyx trifolii* used to be abundant on the willow and star-grass respectively in May and June, but are fast becoming exterminated by the cupidity of collectors for exchange. In August, too, the plants of ragwort, especially towards Hightown, the next station beyond Hall Road, are often eaten to the root, stalks and all, by the beautiful caterpillars of *Euchelia jacobæa*; while a little earlier, say in July, on the thistles growing on the bare sandhills—bare but for the star-grass—the larvæ of the painted-lady butterfly (*Pyrameis cardui*) may at times be taken in scores: the butterfly appearing in August. Among the *Coleoptera* the species sure to be met with are: *Cicindela hybrida*, on the bare sandhills, but only on hot sunny days; *Dyschirius impunctipennis*, often abundant on sunny days on the shore near high-water mark; *Cillenus lateralis*, frequent on the shore towards Hightown, but only to be found where there is clay; *Bembidium biguttatum*, *B. aeneum*, *B. minimum*, *B. bipunctatum*, *B. concinnum*, and *B. lunatum*, all common beneath rejectamenta, and beneath seaweed, especially about the mouth of the Alt, a small river which flows into the sea at Hightown; *B. pallidipenne*, abundant, especially clinging to the under-sides of small pieces of wood and bark on the shore at about high-water mark; *Calathus flavipes* and *C. mollis*, both abundant under rubbish, and at roots of grass on the sandhills; *Broscus cephalotes*, common under drift-wood on the shore above high-water mark, frequently forming a burrow a couple of inches deep; *Dichirotrichus pubescens*, abundant under rejectamenta on

the shore near Hightown; many local species of *Staphylinidae* on the shore; *Sarrotium clavicone*, occasionally found crawling up the bare sandhills (it never seems to get to the top); *Saprinus aeneus* and *nitidulus*, abundant, and *maritimus* and *quadrastriatus*, less frequent, in dung and carrion; *Parnus auriculatus*, often in thousands on the bare sandhills, and occasionally *Heterocerus marginatus* may be found where the shore is muddy. Among the *Lamellicornia*, *Onthophagus fracticornis* is abundant, burrowing beneath dung, while many species of *Aphodius* occur abundantly in spring, such as *A. subterraneus*, *granarius*, *plagiatus*, *inguinatus*, *pusillus*, &c., while on rare occasions *melanostictus*, *villosus*, and *porcatus* have occurred. *Psammobius sulcicollis* is frequent, and *Ægialia arenaria*, abundant, the latter principally on the barest sandhills. *Anomala Frischii* is frequently common on the wing, and at rest on the star-grass on the higher sandhills, especially near the shore, but is only found on hot, sunny days; and *Oxythyrea stictica* has occurred in the flowers of *Rosa spinosissima* in June. *Limonius cylindricus* is common, both crawling on the sandhills and on the dwarf sallow, from which it can be obtained by sweeping. *Zeugophora subspinosa* is abundant on poplars, along with *Phratora vitellina*—the latter on willows as well; the plants of ragwort usually swarm with *Thyamis tabida*; *Crepidodera transversa* is frequent on herbage growing by the river Alt; and *Sphaeroderma cardui* is often common about the thistles, where *Pyrameis cardui* larvæ are feeding. Among the *Heteromera*, *Heliopathes gibbus* and *Microzomus tibiale* are abundant on the bare sandhills; *Cistela murina* is common on all sorts of plants; *Lagria hirta* is frequently swept from the sallows, &c.; *Anthicus bimaculatus* has occurred a few times; *Notoxus monoceros* is common, crawling on the sandhills. The *Rhynchophora* are not largely represented at Crosby, but *Cneorhinus geminatus* is swarming on the bare sandhills in spring, and again occurs in autumn; *Polydrusus cervinus* and *Phyllobius oblongus* are common on sallows; *Otiorrhynchus ovatus* is frequent, and *Sitones griseus* abundant on the bare sand; *Cleonus sulcirostris*, abundant about thistles; *Hypera*, several species; *Erikrinus bimaculatus* (occasional), and *E. acridulus* (frequent), under rejectaments at Hightown.

Wallasey sandhills, on the Cheshire coast, are, perhaps, the most frequently visited of all our entomological localities. These sandhills, which differ considerably in the character of their vegetation from those on the opposite side of Liverpool Bay, may be reached either from New Brighton or from Seacombe, for both of which places there are boats leaving the landing stage at intervals of not more than every half hour. If the boat be taken to New Brighton, the shore must be followed for about a mile, until beyond the yellow and red sandstone cliffs, locally yclept the "Yellow" and "Red Noses," on the distal side of which the sandhills commence, though for the nearest half-mile they are so bare that, except for a few species of *Coleoptera*, they scarcely repay working. If Seacombe be selected as the starting point the tram-car should be taken from Seacombe Ferry as far as Liscard Village (the end of the 2d. fare), and the road immediately

opposite where the tram stops (Wallasey Road) being followed will lead the traveller directly through Wallasey village on to the sandhills in their best parts. The distance from Liscard Village is about two miles, rather under than over, and in following the road either the fork may be taken which *rises up to* Wallasey Church, and which eventually leads past the Claremont Schools, across a piece of waste ground and down the lane opposite a row of cottages on to the sandhills, or the main road which *descends* just before reaching the Church, and then turns to the right to form the main street of the village. The former road offers a little better collecting for the Lepidopterist, by beating the hedges, than the latter.

Arrived on the sandhills, the Lepidopterist need have nothing to complain of, nor need the Coleopterist, nor would the student of any other Order of insects go away without many species of interest, providing the weather be suitable. Among the Diurnal *Lepidoptera*, the only butterfly not of universal distribution, which haunts this district, is the "Grayling" (*Salyrus Semele*), and during August this is abundant, and it is most interesting to notice how the species has a habit of settling on the bare sand, where it is not easily observed, owing to the harmony between the speckled pattern of the under-sides of the wings, and the surface on which it rests. During August and September, by examining the tufts of yellow bed-straw (*Galium verum*) the larvæ of *Chærocampa porcellus* and *Macroglossa stellatarum* may be found, and that of *Deilephila galii* may be looked for at the same time, for it once occurred in abundance here (in 1870), but has not been met with since. On the same tufts may probably be found the larvæ of *Melanippe galata* and *Eubolia lineolata*, both of which species are common on the sandhills, just beyond Wallasey Village. The larvæ of *Arctia fuliginosa* may be found throughout the autumn on low plants, and those of *Bombyx rubi* among the tangled grass, and *Rosa spinosissima*, but both these species hibernate, and are difficult to get through the winter, though, by adopting Mr. Robson's plan—or, at any rate, the one recommended by him,—of enclosing a single full-fed larva of the "fox" moth in a chip-box, and leaving it for a few weeks in the fender by the kitchen fire, they may often be got to form their cocoons, and to emerge early in the following year. By shaking the herbage hanging from the sandy banks, *Mamestra albicolon*, *Leucania littoralis*, *Heliothis peltigera* (occasionally), and many other species of *Noctua* may be obtained in good condition; while, by examining the ragwort flowers with a lantern, *Agrotis valligera*, *tritici*, *aquilina*, *cursoria*, *nigricans*, and *præcox*, *Hydræcia nictitans*, &c., may be taken in abundance on favourable nights in August and September, while at the same time there is a chance of *Sterrhæ sacraria* on the same flowers, for it has occurred here a few times. Several of the above-mentioned *Noctua*, *Agrotis valligera* especially, may be seen during the day-time, even in the hot sunshine, on the ragwort flowers, but they fall off at the slightest alarm. The Wallasey sandhills, as everybody knows, are the home of at least three species of Lepidopterous insects, which scarcely, if at all, occur elsewhere, viz.: *Nyssia zonaria*, though this has spread itself, and been transplanted for some distance along the coast; *Rhodaria sanguinalis*; and *Peronea permotana*. *N. zonaria* occurs in the imago condition

during April and May, the males being very conspicuous as they sit on the bare sticks of last year's willows, or on tufts of grass. The larva feeds principally on sallow (very rarely on yarrow, if it can get anything else) during June and July, and is also very conspicuous. *R. sanguinalis* is confined to those portions of the sandhills where thyme grows—just beyond Wallasey Village, near the small plantations, is a good place for it, and it flies about 6 p.m. during fine days in June. *P. permutana* occurs in August among *Rosa spinosissima*, and the best place for it is among the tangled grass and rose growing about a mile N.W. of where the sandhills are entered from Wallasey Village. It flies during the early evening, but may be smoked out in the day time. During September, the larva of several of the *Eupithecia* may be found on the flowers of the ragwort, notably those of *E. centaureata*, *E. virgaureata*, and *E. absynthiata*, while on the ragwort growing in the gardens on the edges of the sandhills may be found the larva of *E. succentraureata*, and that of *E. linariata* in the unripe fruit of toad-flax growing in similar places. Many rare species of *Tineina*, of which, however, I know little, occur on these sandhills, especially members of the genus *Gelechia*.

Turning to the *Coleoptera*, we notice a great similarity to those mentioned as occurring on the opposite side of the river, but there are species here which do not occur there, and vice versa. *Elaphrus cupreus* and *riparius* are common on the edges of the "flashes" of water in the hollows between some of the sandhills; *Notiophilus aquaticus*, and, occasionally, *substriatus*, may be found in similar localities, together with *Anchomenus marginatus*. *Dyschirius globosus* is sometimes abundant in damp hollows, and *Aphodius plagiatus* has a habit of frequenting like situations, completely burying itself in the sand. Some of the deeper collections of water swarm with the commoner *Dytiscidae*, but among these may occasionally be found *Dytiscus punctulatus*. *Coccinella mutabilis* is often abundant in the late summer months, crawling everywhere, while *Aphodius* revel in the dung of the New Brighton donkeys. Out of the thirty-nine species of *Aphodius* recognised as British, I have taken at least twenty-two species in this locality. *Agelastica halensis* is sometimes abundant in autumn, seeming to have a partiality for the yellow bedstraw. *Grypidaeus equiseti* is frequently found crawling on the bare sandhills, *Hypera nigrirostris* is usually abundant; *Orchestes salicis* and *Rhamphus flavigornis* are abundant during the summer, and may be taken in the sweeping-net; while several species of the genus *Apion* seem to be always abundant. These sandhills, too, are the haunt, among bees, of *Colletes cunicularia*, found, I believe, nowhere else.

Bidston Hill may be reached most easily from Birkenhead. Arrived at Birkenhead Ferry take the "Docks Station" tram-car, ask the conductor to set you down at the nearest place for Bidston Hill, from which you have a quarter of an hour's walk before reaching your destination. The conductor will point out the road.

Here, among the heather and gorse, the Lepidopterist will meet with, in July, *Lycana Egon* in abundance, but local, the best place for it being among the gorse between the windmill and observatory, but nearer the eastern (or Birkenhead) side of the hill. In August, *Satyrus Semele* is abundant near the old mill, while early in

June the gorse swarms with *Eubolia palumbaria*, though difficult to obtain in good condition. On the heather may be found in late autumn and early spring the beautiful larva of *Agrotis porphyrea*, and the perfect insect may occasionally be taken during the summer on the wing. The plantations on the west slope of the hill produce, by beating the birch during September, the larvae of *Notodonta dromedarius*, *Lophopteryx camelina*, and *Amphidasis betularia*, though the perfect insects of these species are seldom seen in the neighbourhood. The fir plantation on the east slope produces *Trachea piniperda*, *Eupithecia indigata*, and *Fidonia piniaria*, besides other species. Although "smoking is not allowed on the hill," some of the Liverpool collectors manage, in defiance of the notices, to take by smoking the gorse bushes during early spring, *Peronea mixtana* and *Depressaria umbellana* in abundance. The *Coleoptera* of Bidston Hill are not numerous. *Cymindis vaporariorum* has occurred once, when I took two specimens, in October; *Bembidium lampros*, var. *velox*, occurs sparingly, and *Bembidium nigroornata* rarely. Among the dead leaves of heath may be found in September, and throughout the winter, *Bradycellus harpalinus* and *B. similis* in abundance, and *Dromius nigriventris* occasionally. On the heather, nearly all the year round, *Adimonia suturalis* is as abundant as it is variable. *Carabus catenulatus* is occasionally met with about the hill, under stones, and *Hylobius abietis* has attacked several of the firs in the plantations—on which latter trees, too, *Coccinella oblongo-guttata* and *C. 18-guttata* are common in spring. *Diptera* are very numerous, especially in the plantations, though I have never stayed to ascertain the species, being glad to get away from them as soon as possible.

Simmonswood Moss is a splendid locality for insects, but is, unfortunately, fast disappearing under cultivation. It would be oftener visited by entomologists were it not for two reasons, viz., the long distance from the nearest station, and, secondly, the close preservation of game for the Earl of Sefton. To get to Simmonswood it is necessary to take the train from the Exchange Station to Kirkby (pronounced Kirby); leaving the station, turn to the left across the railway bridge, again to the left a few yards further on, and keep the main road, which at a distance of about four miles terminates on the "moss."

Here, in June, *Chortobius Davus* is abundant; in September the small birches produce by beating, plenty of larvae, including: *Notodonta dromedarius*, *Lophopteryx camelina*, *Leiocampa dictaoides*, *Acronycta leporina*, *Amphidasis betularia*, *Platypteryx falcula*, &c., &c. At the same time, by searching under the plants of heather, *Hydræcia nictitans* and *Celaena Haworthii* may be found in plenty; the larvae of *Saturnia carpini* are tolerably common, but a little sooner in the year, on the flowers of the heath, the imagines being abundant in May, when I have known over 200 males to be taken in a single afternoon with a freshly emerged female. The moss produces some good beetles, such as; *Carabus nitens* (rarely), *Anchomenus ericeti*, *Elater balteatus* (in June), *Cryptocephalus bipustulatus* (rarely), *Coccinella hieroglyphica*, &c., &c.

These are the more important of the entomological localities in this district, others there are which can scarcely find a place in such a sketch of the district as

has been given above. In conclusion, I may mention the splendid collections of British *Lepidoptera*, and of European *Rhopalocera*, made by the late Nicholas Cooke: the British collection containing, in addition to his own, that of the late Noah Greening, of Warrington, and a selection from that of the late Edwin Birchall, of the Isle of Man. These collections were bequeathed by Mr. Cooke to the citizens of Liverpool, and are deposited in the Liverpool Museum, where, though far from being completely arranged, for their donor died while engaged in the enormous task of re-arranging the entire collection, they may be seen by any one interested on application to our courteous curator, Mr. Thomas J. Moore.

3, Brougham Terrace, Liverpool :
July 10th, 1886.

NOTES ON THE GENERA *CÆROSTERNUS* AND *IDOLIA* (*HISTERIDÆ*).

BY GEORGE LEWIS, F.L.S.

In 1852, Leconte established the genus *Cærosternus* in the Proc. Acad. Phil., vi, p. 39, for the reception of two insects, *C. americanus* and *lævissimus*, but it is impossible to retain these two species in the same genus, nor should they at any time have been placed together. The antenna of *C. americanus* has a solid club, and in *C. lævissimus* the club is clearly 3-articulate, while the exoskeleton of the first is essentially different from that of the second in form and sculpture. I propose, therefore, to retain Leconte's genus *Cærosternus* for the first-named species *americanus*, with this special emendation, that the club of the antenna is solid.

In 1885 I formed the genus *Idolia* (Ann. Mag. Nat. Hist., p. 214) to receive two insects, one, *punctisternum*, from Blumenau, S. Brazil, the other, *lævigata*, from Honduras, and I find now that both of these are congeneric with *C. lævissimus*, Leconte, but what the specific differences may be I cannot say. At present, it is well to consider Leconte's "*lævissimus*" as undescribed, for all he says regarding it applies to four or five species of *Idolia* which are now before me. This is Leconte's description:—" *C. lævissimus*: upper surface very smooth and shining, the epipleura less suddenly inflexed than in *C. americanus*, with only two very fine lateral striae; the dorsal striae of the elytra obsolete. The body is narrower and more elevated than in the preceding" (*americanus*).

In 1811, Paykull published a description of *Hister lævigatus*, which Marseul, in his Monograph, 1855, considers to be the same species as Leconte's *lævissimus*, for until recently it was assumed by authors that there was only one species of this curious form in the family, while now my opinion is that species allied to it are numerous in Central America.

When I wrote my description of *Idolia lœvigata* I considered *Hister lœvigatus*, Paykull, a true *Tribalus*; as, however, it is an *Idolia*, I suggest the name of *gibba* for my species, Paykull's name having the priority of 75 years.

The members of the genus *Idolia* are difficult to characterize, as the general structure in all is very much the same, and the specific differences are few, and such as require the microscope to reveal them. The localities given by Marseul for *Tribalus lœvigatus* are United States, New Granada, Yucatan, Venezuela, Cuba, and St. Domingo; but I think it probable that specimens of *Idolia* from these places on close examination will prove, in some instances, to be specifically distinct. Crotch did not include *Tribalus lœvigatus* in his Catalogue of the *Coleoptera* of the United States, and it is probable this locality has been recorded in error, as Dr. Horn has stated in his Synopsis.

A list of the names and synonyms of the four species may read as under:—

CÆROSTERNUS AMERICANUS, Leconte, 1852.

Tribalus americanus, Leconte, 1845.

Tribalus americanus, Marseul, 1855.

Tribalus marginifer, Marseul, 1862.

IDOLIA LŒVIGATA, Paykull (*Hister*), 1811.

? *Cærosternus lœvissimus*, Leconte, 1852 (undescribed).

IDOLIA GIBBA, Lewis, 1886.

lœvigata, Lewis, 1885.

IDOLIA PUNCTISTERNUM, Lewis, 1885.

There are two species more to be added shortly from the Godman collection.

Wimbledon: June, 1886.

DESCRIPTION OF A NEW GENUS AND SPECIES OF
HEMIPTERA-HETEROPTERA.

BY JOHN SCOTT.

On turning over the leaves of one of the back volumes of the Entomologist's Monthly Magazine, in search of some information which I wanted, I stumbled upon a note at page 71, vol. xiv, relating to the exhibition of a certain Hemipterous insect at a meeting of the Entomological Society. This note recalled to my mind that I had specimens of this very insect standing in one of my boxes of unnamed

species. I at once set to work and brought it to light, and below give a description of it, as it does not appear to have been described previously. The specimens were living when given to me many years ago by Mr. W. Wilson Saunders, who informed me that he thought they had come amongst a lot of ferns he had had from the West Indies. It being found feeding on the leaves of an orchid from Bahia, rather conflicts with the foregoing statement, but Mr. Saunders may have had other plants from abroad at the same time, and finding the creature on the ferns made no further search for it.

Genus *TENTHECORIS*.

Head almost twice as broad between the eyes as across the crown.

Crown: anterior margin somewhat convex; face almost perpendicular, slightly convex, side lobes nearly as long as the central lobe, slightly convex exteriorly.

Antennæ placed at and close to the lower margin of the eyes, shorter than the body; 1st joint very short, 2nd elongate, gradually thickened from the base to the apex; 3rd almost cylindrical, about $1\frac{1}{2}$ times as long as the 2nd; 4th and 5th thin, together shorter than the 3rd; 5th short, about $2\frac{1}{2}$ times shorter than the 4th. Eyes prominent, projecting beyond the anterior margin of the pronotum, viewed from above almost globose, from the side oval, widest at the top. Rostrum reaching to between the 2nd pair of coxae. Pronotum constricted in front, anterior margin slightly concave; lateral margins almost straight, gradually widening to the hinder angles, across which the disc is more than twice as broad as the anterior margin; posterior margin convex at the sides, very slightly concave across the scutellum. Scutellum triangular. Elytra: anterior margin convex, widest near the base of the cuneus, from whence to the apex of the membrane it is very greatly deflected. Membrane with one large triangular cell, the inner angle narrowly rounded. Legs moderate.

TENTHECORIS BICOLOR.

Deep steel-blue and red, shining.

Head red. Antennæ, 1st and 2nd joints red; apex of the former narrowly black, of the latter more or less broadly clouded with black, sparingly clothed with short semi-erect pale hairs; 3rd black; 4th and 5th yellow. Eyes very deep purplish-black.

Thorax: pronotum bright red, shining, finely punctured. Scutellum deep steel-blue, shining. Elytra, clavus and corium very finely rugose, deep steel-blue, shining; anterior margin of the latter broadly bright red, the colour gradually widening to the base of the cuneus, and sparingly clothed with short yellowish hairs; cuneus bright red, sparingly clothed with short sub-depressed yellowish hairs; inner angle deep steel-blue. Membrane darkish brown between the base and the apex of the cell; anterior margin and round the apex broadly pale, finely rugose, the wrinkles running longitudinally; cell darkish brown; cell-nerve very dark brown, with a very fine pale margin exteriorly. Legs vary in colour from reddish-yellow to red; coxae and fulcra generally yellow.

This genus, in appearance, is not far removed from that of

Stiphrosoma, but the head is different in shape, the antennæ stouter, and the joints of the same of different relative proportions. The membrane also having but one cell, and that of a triangular shape, is an excellent guide for detecting the genus.

Lewisham : *May 1st, 1886.*

Tychius haematocephalus at Gosport.—In the year 1873, I announced in this Magazine the capture, at Gosport, of several specimens of *Tychius haematocephalus*, from under plants of bird's-foot trefoil; since that time I have, on many occasions, searched for it without capturing another specimen. On Friday last, May 28th, having a few hours to spare, I determined to work the locality well: its old habitat after two hours' hard work, only produced one specimen of *Sitones* *Waterhousei*. Leaving that spot, I walked along about 800 yards further, and sat down to rest; seeing some clumps of dried grass, I proceeded to pull them up, and shake them over my paper, when out fell quite a number of the creatures I was in search of: I had evidently accidentally hit upon its head quarters. What it was doing so late in the season at the roots of the grass I am unable to say, as the bird's-foot trefoil is certainly its food-plant, and among it it will be taken later on.

I have spare specimens of *Philonthus cicatricosus*, *Tychius haematocephalus*, and *Mecinus collaris*, and will send a pair of each to any of your correspondents who will forward a box and return postage. I am badly in want of type specimens of English *Noctuæ* (except the commonest species), and of European butterflies, for our Natural History Society's collection; if any one can assist me in these, of course I will pay return postage.—HENRY MONCREEFF, High Street, Portsmouth: *July, 1886.*

Homalium Allardi near Birmingham.—In July last year several specimens of *Homalium Allardi* occurred in my garden at Smallheath under bones placed to attract *Homalotæ*. This was a strictly casual and inexplicable find, as I never, before or since, met with the beetle in the district. In October *Eutheia Schaumi* turned up in a similar manner under the same conditions.—W. G. BLATCH, 214, Green Lane, Smallheath, Birmingham: *July 15th, 1886.*

Homalota eximia at Bewdley.—On May 1st I paid a visit to the banks of the Severn at Bewdley, in search of *Homalotæ*, and amongst my captures were two specimens of *H. eximia*, a species hitherto found, I believe, only in Scotland. They occurred in a sandy place, the habitat of *Ammæcius brevis*. I have carefully collated my insect with both Sharp's description and Rye's types. At the same time I secured a few *Tachysa scitula*, a species not previously recorded from the locality.—ID.

Phlaeophagus spadix, *Hbst.*, near Newhaven.—During a ramble with my friend Mr. J. J. Walker in the neighbourhood of Newhaven, Sussex, on June 3rd, we had the pleasure of finding this beetle in some numbers in old timber. A few *Bryaxis Waterhousei* also occurred under stones.—J. H. A. JENNEE, 4, East Street, Lewes: *June 22nd, 1886.*

The unusual scarcity of large Lepidoptera.—We are apt to fancy that a hard winter is good for insect life; but somehow the period of prolonged cold this year from the early days of January to past the middle of March does not seem to have had a beneficial effect.

The cold spring that followed the prolonged winter had the further effect of retarding the appearance of many species. When *Anthocharis cardamines* first made its appearance in this locality I am quite unable to record, not having seen a single specimen. On June 5th I saw the first specimens of *Chrysophanus Phœas*, and also *Canonympha Pamphilus*. Not a single "blue" has yet been seen by me. *Hipparchia Janira* appeared with the very hot weather of July 4th to 7th.

All the fields about this neighbourhood have been unusually full of sorrell, so as to look quite red; I am very curious to know whether that feature of the landscape will be followed by the same profusion of *Chrysophanus Phœas*, which occurred some twenty years ago, when I counted 300 of the butterfly one morning on one long border of geraniums against a wall. The Geometric spiders had then an unusual feast of butterflies, for the specimens of *Phœas* got entangled by dozens in the spiders' webs, where they might be seen hanging like "ropes" of onions. I always look back on that as one of the most extraordinary entomological sights I ever saw, and regret much that I did not make any record of the date of such an occurrence.

Arctia Caja must have been getting scarcer here for some time, but certainly this year I have not seen a single larva; formerly it used to be so very common. Of *Spilosoma menthastri* I have only seen a single specimen, though of *lubricepeda* I have seen a fair proportion. The larva of the latter species regularly eats my ferns to bare mid-ribs every September, and last autumn I noticed for the first time larvae of *Euplexia lucipara* also devastating the ferns.

I may here remark that the most striking character of the larva of *lucipara* had escaped my notice, till I had the larva actually before me. I allude to the two *conspicuous, slightly raised, small white spots on the back of the twelfth segment*. They are visible enough in Hübner's figure, when you know you have to look for them.

Most of my correspondents complain of the scarcity of *Lepidoptera* this season; but perhaps some may have been exceptionally fortunate, and may be able to record a different experience.—H. T. STANTON, Mountsfield, Lewisham: *July 10th, 1886.*

Description of the larva of Pædisca bilunaria.—Although I have been examining birch catkins for a few years past, I have not chanced to meet with the larva of this species until the present spring, when it occurred in almost all the gatherings of catkins which I made. It is full-fed later than any of the five species which I have at present found feeding in birch catkins; the larvae were full-fed this year about the end of April: the first began to make its cocoon on the 25th, but did not pupate until about a week later, and emerged on the 3rd of June. In colour, the larva is yellowish-white, with the head blackish-brown, as is also the second segment and the front legs. It is rather swollen and slightly flattened about the central segments. Head and anal segments small; spiracles distinct, but not large, with two smaller spots above each, which are rather more forward than the spiracle; dorsal line

darkish; the intestinal canal showing through the skin of the sixth and seventh segments as a large, dark, irregular blotch. On the second segment the dorsal line shows as a slender faint line; sub-dorsal line indicated by a row of spots, two on the side of each segment, the anterior one being the higher; a dark spot on the ventral pro-legs, with a smaller one above it; anal pro-legs with one dark spot; anal plate ovate, edged with brownish, and with two dark spots on the upper edge; the preceding (12th) segment has a large, long, dark spot or dash placed across the dorsal line, with a small spot at each end; skin smooth, with very minute hairs from the spots. When approaching full-growth, the larva is often nearly as large in girth as the catkin it inhabits, and, of course, eats away the entire inside of the catkin, the outer surface of the catkin being carefully webbed inside and so held together. When touched, the larva has the habit of exuding a dark fluid. The first that indulged in this freak made me believe I had crushed its head, but I could not detect any injury, and an imago was afterwards produced from it, and subsequently I have noticed other larvæ do the same. Pupation takes place sometimes in the catkin, or, rather, in the cylindrical web coated with the outer skin of the catkin, at other times it is between, or under, dead leaves in a white silken web. The pupa is a delicate light brown, the dark intestinal blotch already mentioned showing until the pupa case begins to darken previous to the emergence of the insect. Eye-cases rather projecting, and slightly darker. Two rows of minute points on the back of each segment.—A. BALDING, Wisbech: *June 7th, 1886.*

Ochsenheimeria vaculella in abundance at Lewisham.—On July 12th I was fortunate enough to capture one hundred and fifty specimens of the little known *Ochsenheimeria vaculella* under the bark of one willow here: on the 10th I took about fifty. I imagined it was partial to willow, but found it also under the bark of alder and oak.—ALFRED BEAUMONT, 3, Ladywell Park, Lewisham: *July 14th, 1886.*

Ponera punctatissima, Rog., at Bromley, Kent.—Whilst sweeping for *Coleoptera* in a wood near here, on the evening of the 1st July, I captured a winged female of a *Ponera*, which I thought, of course, was *contracta*, but never having taken the species before, I was very glad to meet with it; I was, therefore, considerably surprised to find on examination that my insect was *punctatissima*, instead of *contracta*, especially as I had always regarded the former species as a very doubtful native, it generally having occurred in houses, &c. Near the wood are situated several recently erected houses, and it may possibly have escaped from one of these; but I thought its capture in such a locality was at any rate worth recording. I may add that I have been twice to the locality since, but have been unable to secure other specimens.—EDWARD SAUNDERS, St. Ann's, Mason's Hill, Bromley, Kent: *July 12th, 1886.*

THE SOUTH LONDON ENTOMOLOGICAL AND NATURAL HISTORY SOCIETY,
June 17th, 1886: R. ADKIN, Esq., F.E.S., President, in the Chair.

Messrs. A. T. Storey and A. Eland Shaw were elected Members.

Mr. Jager exhibited *Erastria venustula*, Hb., from Horsham. Mr. E. Cook, *Heliaca tenebrata*, Scop., and *Emmelesia albulata*, Schiff. Mr. Sheldon, forms of

Hepialus lupulinus, L., and bred series of *Earias chlorana*, L., and *Crambus chrysonuchellus*, Scop. Mr. Frohawk, *Acontia luctuosa*, Esp., from Cudham, and the life-history of *Cidaria silacea*, Hb. Mr. Wellman, *Nemeobius Lucina*, L. Mr. W. A. Pearce, *Pygæra pigra*, Hufn., also *Cucullia verbasci*, L., from larvæ found at Mickleham. Mr. J. T. Williams, *Acronycta alni*, L., and a fine series of *Aphomia sociella*, L., bred from the cluster of cocoons found by him under a stone in his garden at Fooths Cray, and which were exhibited by Mr. Billups at the meeting of the Society held on the 15th April last. Mr. Billups exhibited large groups of the larvæ of *Hyponomeuta padellus*, L., which he said he had received from Gravesend, and he understood that an enormous amount of damage had been caused by these larvæ to the whole of the apple orchards in Kent and Oxfordshire. A discussion then took place as to the probable cause of the appearance in such large numbers of these larvæ, and the best means of exterminating them, in which Messrs. Adkin, Tugwell, J. T. Williams, Chaney, Wellman, West, and others took part. Mr. Billups also exhibited the following Ichneumonidae bred by Mr. Elisha: *Colastes braconius*, Hall, from *Lithocolletis spinicolella*, Kol., Sta.; *Apanteles bicolor*, Ns., from *Lithocolletis lantanella*, Schr., Sta.; *Limneria interupta*, Gr., from *Sericoris euphorbiana*, Frr.; also *Mesoleius sanguinicollis*, Gr., and *Pimpla brevicornis*, Gr., both bred by Mr. Wellman from *Gracilaria stigmatella*, Fb., Sta.; and he also exhibited two species of Tenthredinidae—*Allantus viennesis*, Schr., and *Hylotoma caeruleipennis*, Ktz., taken in copula at Hayling Island on the 7th June.

July 1st, 1886: The President in the Chair.

Dr. C. Mordaunt Matthew, and Messrs. Pawsey and R. E. Salwey were elected Members.

Mr. T. W. Hall exhibited a varied series of *Lycæna Icarus*, Rott. Mr. W. West, some interesting forms of *Acronycta megacephala*, Fb. Mr. E. Joy, *Anesychia decemguttella*, Hb., Sta., bred from larvæ beaten near Wicken Fen. Mr. South, *Eupithecia togata*, Hb., bred from Perthshire pupæ, and a fine variety of *Melanippe fluctuata*, L., taken on a fence in the neighbourhood of St. John's Wood. Mr. Wellman, *Thecla rubi*, L., in one specimen the white spots on the under-side being absent; a variety of *Lycæna Icarus*, Rott., a long series of *Eupithecia rectangulata*, L., var. *nigrosericeata*, Haw., and a light gray variety of the same species; also a series of *Acitilia galactodactyla*, Hb., bred from larvæ taken during the Society's excursion to Horsley on the 29th May last. Mr. Sheldon, *Angerona prunaria*, L., *Dianthacia conspersa*, Esp., bred from Deal larvæ, *Asthenia luteata*, Schiff., and *Phoxopteryx derasana*, Hb., from Riddlesdown. Mr. Billups exhibited two living larvæ of *Boarmia repandata*, L., handed to him by Mr. South, and which showed a curious arrangement of the cocoons of a species of *Panteles*; the larvæ spun a little pad of silk, then bent themselves into a bow on the twig and the parasites began to creep out of the host and form their cocoons to which the larvæ seemed to be affixed.

—H. W. BARKER and W. A. PEARCE, Hon. Secs.

ENTOMOLOGICAL SOCIETY OF LONDON, July 7th, 1886: J. JENNER WEIR, Esq., F.L.S., Vice-President, in the Chair.

Mr. S. H. Scudder, of Cambridge, Mass., United States, was elected a Foreign Member of the Society.

The Rev. H. S. Gorham exhibited specimens of *Eucnemis capucina* (Ahr.), a species new to Britain, discovered in June last in an old beech tree in the New Forest. He also exhibited specimens of *Cassida chloris*.

Dr. Sharp exhibited larvæ of *Meloë*, and read notes on their habits; and Mr. Saunders exhibited a specimen of *Halictus* infested with about thirty *Meloë* larvæ.

Mr. Billups remarked that he had recently found forty-seven larvæ of *Meloë* on a specimen of *Eucera*.

Dr. Sharp said that he was of opinion that the operations of these larvæ were not the result of instinct, but were more like reflex actions; the instant the larvæ touched a suitable surface they clung to it. The discussion was continued by Prof. Riley, who disagreed with Dr. Sharp, and believed that these larvæ were guided by instinct, as they showed a decided preference for particular hosts.

Mr. Jenner Weir exhibited a male of *Lycæna bellargus* and a female of *L. icarus*, which had been captured in copulâ by Mr. Hillman, and shown to the exhibitor at the time of capture. Mr. Weir also exhibited some specimens of *Lycæna* which he believed to be hybrids between *Lycæna bellargus* and *L. icarus*; and he further exhibited, on behalf of Mr. Jenner, four specimens (all males) of *Phosphaenus hemipterus*, taken at Lewes.

The Rev. W. W. Fowler exhibited two specimens of *Chrysomela cerealis*, lately taken by Dr. Ellis on Snowdon; and also two specimens of *Actocharis Readingi* found at Falmouth by Mr. J. J. Walker.

Mr. E. B. Poulton called attention to the fact that the larvæ of some *Lepidoptera*, if fed in captivity on an unusual food-plant, subsequently refused to eat their ordinary food-plant. He stated that he had observed this with the larvæ of *Pygæra bucephala* and *Smerinthus ocellatus*. Mr. Stainton, Mr. Fowler, and others, made some remarks on the subject.

Mr. Elisha exhibited a series of bred specimens of *Geometra smaragdaria*, together with the cocoons, containing the empty pupa-cases, attached to the stems of the food-plant.

Mons. Alfred Wailly, who was present as a visitor, exhibited a long series of silk-producing moths, including some remarkable hybrids between *P. Cecropia* and *P. ceanothi*; and Professor Riley and Mr. Weir made some observations on these hybrids.

Dr. Sharp read a paper on " *Eucnemis capucina* (Ahr.) and its larvæ."

Dr. Dunning read a report on the subject of the importation of humble-bees into New Zealand, from which it appeared that the efforts of Mr. Nottidge, of Ashford, and the Canterbury (N. Z.) Acclimatization Society, had been successful, and that the long-wanted clover-fertilizer had at length been established in New Zealand.

Mons. Peringuey communicated " Notes on some Coleopterous Insects of the family *Paussidae*."

Mr. J. B. Bridgman communicated " Additions to the Rev. T. A. Marshall's Catalogue of British Ichneumonidæ."

Prof. Riley read " Notes on the phytophagous habit, and on alternation of generation, in the genus *Iosoma*." In this paper Prof. Riley described, from direct observation, the phytophagous habit in two species of the genus. He also established the existence of alternation of generation which was believed to be the first recorded instance in the *Chalcididae*.—H. Goss, *Secretary*.

THE EUROPEAN SPECIES OF THE GENUS *CERYLON*.

BY REV. W. W. FOWLER, M.A., F.L.S.

Having had occasion to study the British species of *Cerylon*, and having found the genus, although a very small one, involved in considerable confusion and uncertainty, I set about obtaining representatives of the known European forms, and through the kindness of Herr Reitter I have been enabled to obtain examples of all of them, as he was good enough to entrust to the post even his almost unique example of *C. atratulum*; in the following notes I am much indebted to Herr Reitter's paper in the Deutsche Entomologische Zeitschrift, XX, 1876, Heft. ii, p. 386, to which the student of the genus is especially referred, a particularly good plate of the several species being given with the paper, which is worth far more than any mere description.

The genus *Cerylon* belongs to the *Colydiidæ*, and, until quite recently, in conjunction with the single genus *Philothermus*, formed the tribe *Cerylonina*, which is distinguished from all the other tribes of the *Colydiidæ* by the small acicular terminal joint of the palpi, the penultimate being large and thick; the first ventral segment of the abdomen is elongate, and all the coxae are more or less widely separated. From the allied genus *Philothermus* the genus *Cerylon* is distinguished by having the club of the antennæ plainly divided into two joints, whereas in *Cerylon* it is, at all events, to all intents and purposes, one-jointed, although the ridged appearance before apex (so evident in *Rhizophagus*) indicates that the antennæ are really eleven-jointed, and the club two-jointed. I believe that lately one or two genera have been added to the tribe, but I have been unable to obtain access to the descriptions, and these are, of course, not necessary for the present paper. The species of *Cerylon* are small, oblong or oval, and more or less depressed, robust insects; they live under the bark of decayed trees, logs, &c.; the described species are upwards of thirty in number; these are widely distributed throughout the world, being found in North and South America, Ceylon, Tahiti, New Caledonia, Madagascar, &c. In the catalogue of Heyden, Reitter, and Weise, eleven species are enumerated as European; some of these are exceedingly closely allied, and there is considerable confusion regarding them: the chief difficulty of determination lies in the fact that the shape of the thorax differs very much in the male and female of the same species, in some being subquadrate or even transverse in the male, with the sides rounded and widened in front, whereas in the female the same part is

longer and narrowed towards the front, being broader at the base; this is very noticeable in many examples of our common *C. histeroides*, which is very variable in the shape of the thorax.

The European species may be thus divided:—

I. Antennæ with the third joint much shorter than second.

- i. Thorax very finely punctured, very broad: general form broad, with elytra strongly widened in middle: striæ of elytra finely punctured
C. magnicollis, Reitter.
- ii. Thorax finely punctured, but more distinctly than in the preceding species: general form oval, with elytra not strongly widened in middle: striæ of elytra finely punctured
C. semistriatum, Perr.
conicicollis, Reitter.
atolicum, Reitter.
- iii. Thorax strongly punctured: general form oblong: striæ of elytra more strongly impressed and more coarsely punctured.
C. evanescens, Reitter.

II. Antennæ with the second and third joints of about equal length.

- i. Form, broader: upper surface pitchy-brown or nearly black.
 - 1. Antennæ more slender: basal impressions of thorax transverse, and rather shallow: thorax rather closely punctured...
C. histeroides, F.
 - 2. Antennæ thicker: basal impressions of thorax longitudinal and deep: thorax strongly and sparingly punctured
C. fagi, Bris.
- ii. Form narrower and more parallel.
 - 1. Upper surface black: thorax with a slight prominence on each side margin, just at beginning of posterior third...
C. atratum, Reitter.
 - 2. Upper surface nearly always ferruginous-testaceous: thorax without prominences at sides.
 - A. Upper surface slightly convex: sides of thorax almost parallel: basal impressions of thorax distinct: striæ of elytra rather fine, becoming evanescent towards apex...
C. ferrugineum, Steph.
 - B. Upper surface much depressed: striæ reaching apex.
 - a. Thorax quadrate with basal impressions large and distinct: striæ of elytra stronger
C. impressum, Er.
 - b. Thorax oblong, very slightly narrowed towards base, with basal impressions very indistinct: striæ of elytra less strong...
C. deplanatum, Gyll.

C. MAGNICOLLE, Reitter.

Rather broad and convex, lighter or darker ferruginous: antennæ moderate, with third joint much shorter than second: thorax broad, with sides rounded and dilated in front in male, somewhat narrowed in front or almost parallel in female, very finely punctured: elytra dilated at sides at about one third the distance from base, and thence gradually narrowed towards apex: striæ of elytra (except sutural stria) evanescent for apical third.

My specimens are from the Caucasus.

I do not feel at all certain as to this species, and am inclined to believe that it is only a form of *C. semistriatum*, which appears to be very variable ; Herr Reitter, in his plate (Deutsche Ent. Zeit., 1876, Tafel ii), gives two figures which he names *C. ætolicum* ♂ and ♀ respectively, but in his own copy of his paper, which he has kindly sent me, he styles them *semistriatum* (*ætolicum. pars*) and *magnicolle* (*ætolicum. pars*), and he has since the date of his first paper separated this latter species.

C. SEMISTRIATUM, Perr. (*attenuatum*, Fairm., *ætolicum*, Reitter., ? *spissicorne*, Fairm.).

This species differs very slightly from the preceding ; the thorax, however, is a little more distinctly punctured, and the general form is more oval, the elytra not being dilated at anterior third : the species much resembles *C. histeroides*, but is more convex and finely punctured, and more narrowed in front ; the striae also of elytra are finer, and the relative proportions in the length of the second and third joints of the antennæ is different ; the colour also is ferruginous. Long., 2 mm.

Under oak-bark, South of France, &c.

v. conicicolle, Reitter.—This variety is smaller than the type form, and has the thorax more contracted in front ; the general form is somewhat more oval and convex. Reitter considers this to be a separate species, and it is very possible he may be right.

Long., 1½ mm.

Caucasus Mountains.

C. EVANESCENS, Reitter.

This species is easily distinguished from the two preceding by its more oblong form, more strongly punctured thorax, and deep and strongly impressed and punctured striae of elytra, which become evanescent towards apex, with the exception of the sutural stria which is deeper at apex ; the thorax is broader than long with the sides almost parallel, and the anterior margin deeply sinuate-emarginate, so that the anterior angles are pronounced and prominent ; from all the following species it may be distinguished by the second joint of the antennæ being much longer than third.

Under beech-bark. Transylvania, Croatia, &c.

C. HISTEROIDES, F.

Dark pitchy-black (ferruginous or reddish-ferruginous in immature examples), not very convex, with the antennæ and legs ferruginous ; thorax thickly and rather strongly punctured, in the male a little shorter than broad, and a little widened and rounded in front, so that its greatest breadth is before middle : in the female it is just as long as broad, very slightly and almost imperceptibly narrowed in front, so that it is broadest at base : elytra slightly dilated and widened at sides, rather depressed, with distinct striae, which are plainly punctured, and usually become obsolete near apex ; interstices flat, finely punctured in more or less irregular rows, legs reddish or pitchy-red.

Long., 2-2½ mm.
G

This species appears to be common and widely distributed over a considerable part of Europe; it occurs under bark of pines, elms, oaks, and many other trees; it has also been taken in nests of *Formica rufa*; the shape of the thorax is variable and this has given rise to much confusion: it is by far the commonest of the British species.

v. caucasicum, Reitter.—This variety (considered a separate species in the catalogue of Heyden, Reitter, and Weise) differs from the type in being ferruginous in colour, and in having the sides of the thorax nearly parallel in the male, and more distinctly contracted in front in the female than in the corresponding sex of *C. histeroides* proper.

Found in the Caucasus region.

v. longicolle, Reitter.—This is a form of the preceding variety, and appears to be chiefly distinguished by its longer thorax.

Euboea, &c. In Dr. Sharp's collection there is a specimen answering to my specimen from Herr Reitter, which is labelled as bought from Turner; whether it is Scotch or English I do not know. I also possess a small ferruginous-red variety from Silesia, which closely resembles *C. ferrugineum*.

C. FAGI, Bris. (*forticorne*, Muls.).

A very distinct species, broader and more convex than *C. histeroides*, and with the elytra more dilated in front; the antennae are shorter and stouter, ferruginous, with the first and last joints lighter, and the thorax is evidently more strongly and much more sparingly punctured, especially on disc, and at the base is furnished with larger impressions, which are oblong, and more distinct than in the preceding species: the thorax, moreover, is almost parallel-sided in the male, and evidently narrowed in front in the female: the striae of the elytra are rather finely punctured, and the interstices, as a rule, are almost smooth; the colour of the upper surface is as in *C. histeroides*.

Long., 2-2½ mm.

Under beech-bark; Hungary, Transylvanian Alps, France, &c.; England, rare, Sevenoaks, Cobham Park, Kent, Twickenham, St. Mary Cray, Dean Forest; Mr. W. G. Blatch possesses one specimen from the latter locality which is remarkable for its very short rounded elytra.

v. excavatum.—Through the kindness of Mr. E. Saunders (who considered it probably a new species), I received some time ago from Mr. W. J. Saunders a remarkable variety of this species, in which the basal impressions are continued nearly to the anterior margin, leaving a large broad raised longitudinal space in middle. I have seen no others like them, and propose for the variety the name of *excavatum*; the specimens were taken at Warlingham, Surrey; it is possible that they may be identical with *C. foeculatum*, Baudi, but I have never seen a specimen of this species or the description; it is, moreover, omitted in the last European catalogue, and Reitter (*l. c.*, page 389, foot note,) states that it is unknown to him.

C. *ATRATULUM*, Reitter.

Very like *C. ferrugineum*, but quite black, antennæ black, with the apex of the last joint pitchy ; elongate, parallel-sided, depressed ; thorax longer than broad, parallel-sided, with a slight prominence or sinuation on each side-margin just at beginning of posterior third ; this is not very marked, and is not so distinct in the actual specimen as in Reitter's plate (*l. c.*) : the elytra are oblong, with two indistinct, broad impressions towards base, with rather deep punctured striae, which are continued to apex or nearly to apex ; legs black.

Long., 2 mm.

Under beech-bark : two male specimens found by Herr Reitter in North-east Hungary, in a mountainous district.

C. *FERRUGINEUM*, Steph. (*angustatum*, Er.).

Rufo-ferruginous, oblong, parallel-sided ; smaller and narrower than *C. histeroides* to light specimens of which species it bears a considerable resemblance : thorax rather strongly punctured, thickly at sides, less thickly on disc, in male a little longer than broad, very slightly widened in front, in female evidently longer than broad, parallel-sided, basal impressions distinct but not large : elytra with sides a little rounded, with rather strong punctured striae, which, at sides, are more or less evanescent towards apex, first interstice next suture with a row of very fine punctures : sutural stria evidently deepened at apex.

Long., 2-2½ mm.

Common throughout North and middle Europe under bark of all kinds of deciduous trees, especially beeches : local in England, but widely distributed. Cobham Park, Kent, New Forest, Dean Forest, Cannock Chase, &c. ; Scotland, Rannoch, Aviemore, &c.

C. *IMPRESSUM*, Er.

Exceedingly like the preceding but a little more depressed and broader, with the thorax especially broader, being almost quadrate in the male, and quadrate in the female ; in the former sex it is slightly transverse, and has the sides feebly dilated and rounded in front ; the basal impressions are much larger, and the striae of the elytra are markedly stronger ; they become feebler behind but reach the apex, or very nearly so ; the sutural stria is evidently deepened at apex.

Long., 2-2½ mm.

A rare species in central and southern Europe : it does not apparently occur in Britain ; it appears, however, to vary as regards size of basal impressions, &c., and I have a variety, from the Morea, in which these impressions are quite small as compared with the type-form ; I have seen specimens from Aviemore and the Dean Forest which are somewhat intermediate forms, but I have never seen a typical British specimen of *impressum*, and would refer these specimens to *ferrugineum* : there is so much difficulty attached to these last three species of the genus, that it is only on quite typical forms that a species should be introduced as indigenous.

C. DEPLANATUM, Gyll.

Closely allied to *C. ferrugineum*, but rather smaller and more depressed ; it is the flattest species of all that have been described : in the male the thorax is evidently, although gradually, narrowed towards base, in the female the sides are almost straight, in both sexes it is longer than broad ; the basal impressions are very small, and often only indicated by a very narrow fovea at base, which sometimes is almost absent ; this point will distinguish it from both the preceding : the striae of the elytra are moderate and reach apex ; the sutural stria is, however, not deeper at apex.

Long., 1½-2 mm.

Rare ; under bark of beech, aspen, and poplar, and, probably, other trees ; Central Europe. The species appears to be very rare in Britain ; I have only seen two or three examples, taken, I believe, by Mr. Gorham in the New Forest ; most of the specimens that stand under the name appear to be small varieties of *ferrugineum*.

The larva of *C. histeroides* is described by Perris (Ann. Fr., 1853, p. 616) : it is elongate, somewhat parallel, entirely white, with reddish head ; head depressed, antennæ four-jointed, first joint thick and short, second shorter and much narrower, third longer than the first two together, fourth slender and very long, as long as all the rest united ; maxillary palpi three-jointed, last joint elongate ; prothorax longer than either meso- or metathorax, both of which are longer than the abdominal segments, which are of equal lengths until the last, which is somewhat developed, and has on the back two papillæ, each furnished with a long hair ; it is deeply emarginate behind, and the lobes of the emargination appear to be trifid at apex ; tarsi short and stout, three-jointed ; legs ciliate. The larva, according to M. Perris, lives in the galleries of *Hylurgus piniperda* of which it destroys the larva ; it also occurs on other trees than pine trees under different circumstances.

The following appears to be the true list of our British species :—

- C. histeroides*, F.
v. *longicollis*, Reitter.
- C. fagi*, Bris.
forticorne, Muls.
v. *excavatum*.
- C. ferrugineum*, Steph.
angustatum, Er.
- C. deplanatum*, Gyll.

In conclusion, I must thank Dr. Sharp, Mr. Blatch, Mr. Champion, Mr. Gorham, and others, for lending me specimens ; altogether I have been enabled to examine some hundreds of British examples of the genus ; among these are certain forms concerning which I still feel doubtful, but I believe they are all to be referred to one or other of the four species just mentioned.

NOTE ON SOME BRITISH COCCIDÆ (No. 4).

BY J. W. DOUGLAS, F.E.S.

LECANIUM ALIENUM, n. sp.

For three or four years past a house-fern (*Asplenium bulbiferum*) has been infested with a *Lecanium* to that extent that the fronds have withered under the constant attacks of the individuals that, in all stages of life and overlaying each other, cover them constantly except in the winter months.

When young the scales are flat and yellowish, very like *L. hesperidum* at the same age; at a later stage they mostly become faintly maculated. When full-grown they are, at the maximum, $3\frac{1}{2}$ mm. long by $2\frac{1}{4}$ mm. broad at the widest part, forming a long oval much widened posteriorly, convex, pale greenish-yellow, the disc with fuscous, coarse, irregular reticulation, anteriorly and posteriorly forming wide, darker transverse patches or bands, the meshes having rounded pale centres, but in the middle of the disc, on each side of a broad, dark longitudinal line, the ground-colour shows as a large pale patch, and similarly as two smaller spots anteriorly; on the dark median line are usually 4—5 very minute yellow elevations in a row; the prominent anal point above the fissure deeper yellowish; the margin wide but scarcely flattened, with strong, black-dotted, transverse, parallel lines throughout. On the under-side the body of the insect is pale anteriorly, fuscous-black posteriorly; the antennæ pale, of seven joints, of which the 3rd is the longest. The adult scales always cover oval yellow embryonic active larvæ, so that the females are doubtless viviparous. When removed from the fronds and dried the adult scales become of a uniform pale brown, and the sides curve under, so that the form is changed. I have not found a male.

In form this species is somewhat like *L. acuminatum*, Sign., but that is only 2—3 mm. long, and appears to be without markings.

It differs from *L. angustatum*, which is narrow throughout, 4—5 mm. long by 2 mm. broad, of a clear yellow colour (apparently without markings), smooth and very flat; whereas this is wide posteriorly, distinctly convex, and is marked as stated.

It appears to resemble *L. maculatum*, Sign., only in being elongate oval, but that is a more regular oval, and has a median series of 8 or 9 brownish spots, which it is stated specially distinguish it from *L. hesperidum*.

The reticulation seems to ally it to *L. tessellatum*, Sign., the form of which is given as broad-oval, much rounded posteriorly, and somewhat flattened, the colour is red-brown, the size $3\frac{1}{2}$ mm. by 3 mm., and the surface exhibits throughout a design of marquetry of irregular fine lined pattern, without other marking; whereas in *L. alienum* the form is long-oval, convex, and the reticulation and markings are formed of strong, dotted, dark lines.

The form and character of these four species are well displayed in Signoret's pl. xi, figs. 1—4.

LECANIUM HIBERNACULORUM, Böisd.

This is described as rather more than 5 mm. in length, $3\frac{1}{2}$ mm. wide, and 3 mm. high, of a reddish-brown colour, globulous, forming more than a hemisphere; the surface with a somewhat regular punctuation of oval pits with a clearer central point, without perceptibly widened margin.

In February Mr. H. W. Bates sent to me from a fern in his greenhouse several scales of a *Lecanium* full of pink eggs. These scales agree in some respects with the foregoing description, but differ in the size being at most only $5 \times 3 \times 2$ mm., in the form being broad, obtuse-oval, very convex, but not globulous, and in having 4—6 very minute, scarcely perceptible, distant tubercles in a line along the middle of the back. Dr. Signoret, however, who has seen some of the scales, is of opinion they must be referred to this species.

In October last Mr. T. R. Billups sent me from a house-fern some scales in every respect like the foregoing, except that they are about half the size, and of the colour of *café au lait*. I judged they were the young form of *L. hibernaculorum*, and Dr. Signoret confirms this opinion. In May I received from Mr. P. Cameron of Sale, on various hothouse plants, fully grown and coloured scales, from which the minute tubercles above mentioned had quite disappeared. There seems to be just a possibility that the young form with the row of tubercles may indicate *L. maculatum*, Sign.

LECANIUM HEMISPHERICUM, Targ.-Tozz.

The ♀ scale is described as circular, hemispheric, the margin broadly flattened, red-brown and more or less shaded in the adult, $3\frac{1}{2}$ mm. long, 3 mm. broad, and 2 mm. high.

From a hothouse at Canterbury Mr. G. S. Saunders, in February, obtained on an orchid and a fern some scales which fairly agree with the above description, except that they are yellow-brown, the margin comparatively slight, and the size less, 3 mm. by $2\frac{1}{2}$ mm. by $1\frac{1}{2}$ mm.

I submitted one of the scales to Dr. Signoret, and he coincides with me in thinking it is *L. hemisphaericum* in the young state.

In April Mr. P. Cameron sent, on several hothouse plants from Sale, larger, darker, and more developed scales of this species, and the number of similar forms simultaneously cause me to doubt if there is any reason for Signoret's query if *L. hibernaculorum* is only a large and redder form of *L. hemisphaericum*; they seem to me to have very distinct characters, which, although they vary somewhat according to age, yet never have an identical aspect.

LECANIUM ULCI, Linn.

In the "Fauna Suecica," p. 265, No. 1019, Linné first noted his *Coccus ulmi campestris*: "Habitat in ulmo campestri;" in the "Systema Naturæ," p. 740, No. 9, he repeats this without any description, refers to the F. S. No. 1019, and to Geogr. Paris, 512, No. 7; this, however, should be 507, No. 8,* which is Geoffroy's *Chermes ulmi rotundus*, thus described:—

"Il est rond, sphérique, brun, de la grosseur et de la couleur des baies de genièvre. Il s'attache aux petites branches de l'orme, qui quelquefois en sont si chargées, qu'elles ressemblent à des grappes."

I find such brown ♀ scales in May on elm bushes in several places in Lewisham, also ♂ scales a week or two earlier from which I obtain the imago.

Walker omits *Lecanium ulmi* from his "List of British Hemiptera (Coccidae)," 1860, although Stephens had long previously included it in his "Systematic Catalogue of British Insects," ii, 368, 9993 (1829), as *Coccus ulmi*, Linn., giving a reference to De Geer, v (should be vi), pl. 28, fig. 7.

De Geer in his "Mémoires, vi, 436, thus writes:—

"Gallinsecte ovale blanche, à bandes transversales brunes, de l'orme.

Coccus (ovatus ulmi) ovatus albus fusco transverse striatus, ulmi.

Coccus ulmi campestris, Linn., Faun., Ed. 2, No. 1019. Syst., Ed. 12, p. 740, No. 9.

Chermes ulmi rotundus, Geogr., Ins., Tom. i, p. 507, No. 8. Le Kermes de l'orme (pl. 28, fig. 7).

"Ces Gallinsectes sont de figure ovale, un peu pointue à l'un des bouts, que je crois être le derrière; elles sont très-convexes en dessus, mais plates ou un peu concaves du côté qui est appliqué sur la branche; leur surface est polie, lisse et un peu luisante. Elles sont blanches et ornées de bandes transversales brunes, de sorte qu'elles ne ressemblent pas mal au ventre de quelques espèces d'Araignées; mais quelquefois on en trouve de toutes brunes."

Now, it is in this country that the wholly brown scales, mentioned as exceptional by De Geer, are the only ones found, and the banded sort appear to be scarce elsewhere also, for Signoret says respecting them (Ess. Cochin., p. 263), "Under the name of *fasciatum* Costa indicates a species figured by De Geer, pl. 28, figs. 7—10, which has

* I follow Signoret and others in this. The want of a description by Linné makes his *Coccus ulmi* obscure, and the doubt as to his meaning is not lessened by his reference to "Geogr. Paris, 512, No. 7," for there is no such No. 7. It is true that Geoffroy, at p. 512, No. 8, has a "*Coccus ulmi*, corpore fusco, serico albo," and a reference to "Réaumur, Ins., iv, t. 7, f. 1, 2, 6, 8, Le cochinelle de l'Orme," yet this is not cited by any author but Schrank (Faun. Boic., 145, 1264) as the species intended by Linné. Schrank's *Coccus ulmi* is really the above *Coccus (Gossyparia) ulmi*, Geogr., as is shown by his description and reference to Réaumur iv, t. 7, f. 1—10; and it is worthy of note that Réaumur is not cited by Linné for his *C. ulmi*. Fabricius (E. S., iv, 225) cites for *Coccus ulmi*, Linn., "Geogr., 507, 8; De Geer, vi, 406, pl. 28, 7," which refer to a *Lecanium*; but by his description "Clypeus rufescens margine villosa, albidus," he apparently intends *Coccus ulmi*, Geogr. I believe, therefore, that Linné's *Coccus ulmi* is rightly a *Lecanium*.

transverse fasciæ (described above). We think that this species is only a variety of *ulmi*, which is fasciated under certain circumstances, as we have taken the opportunity to remark respecting *tiliae*, *corni*, &c., and which may be caused by an unhealthy condition, or by the insect not having been fecundated, or by other unknown circumstances." I may, I think, add that this marking may exist only in the young stage of life, in the same manner that maculation of the scale is frequently observed then in other species, and that it disappears when the insect becomes adult.

Signoret (Ess. Cochin., p. 262) says of this species :—

"The scale is chestnut-brown, round, hemispheric, very convex, 7 mm. long by 5 wide and high, appearing smooth under a lens, but under the microscope showing the punctuation and tesselation of *L. pyri*, *corni*, *tiliae*, and others.

"This species, very near to those described above, is distinguished by having seven joints in the antennæ, the 3rd hairless, very long, as long as the 4th, 5th, and 6th together, these three and the 7th very short and nearly equal; the legs stout, the tarsus one time shorter than the tibia, the claw strong, the digitules very short and slender, those of the claw not extending beyond it; the anal lobes with four hairs on the outer and two on the inner side, the genital ring with eight hairs.

"The male is small, yellow; antennæ of six joints, of which the 4th is the longest, the others diminishing consecutively to the 10th, which is very short, and has two knobbed hairs larger than the others. The pigmentary circle has ten eyes, four large and six small, or ocelli. The thorax has a broad, brown, transverse band. The abdomen a little less broad, diminishes to its extremity, which has the two ordinary long filaments, and the stylet which is as long as the abdomen; the last segment has two small tubercles near the insertion of the filaments. The elytra are transparent, with a tint a little shaded towards the margin. The halteres are stout, and have two filaments at the extremity. The legs are very long and pubescent; the tarsi one-fifth of the length of the tibia."

I thought it desirable to transcribe the foregoing description, not only as a definition of the species, but in order to show the nature and the minuteness of the characters relied upon for specific distinctions in this genus.

LECANIUM ALNI, Modeer.

In the "Götheborgska Vetenskaps Handlingar," i, 23 (1778), Modeer described a *Coccus alni* thus: "Female oblong-ovate, convex, light brown-reddish, without wool or farinose matter (utan ull eller doft); on the angles or axils of branches of alder trees."

On the 24th December last, at Lewisham, on an alder tree (*Alnus glutinosa*) growing by the side of a pond, I found such scales as these, evidently a *Lecanium*; of course they were of the previous season and were discoloured, but I made a mental note that in the spring I

would go again and get some scales of the male, but in April when I visited the place, I found to my disgust, that it had been appropriated for building purposes, the water had been drained off, the trees were dead, and there were no scales. It was not until June 9th that I succeeded in finding some ♀ scales of the *Lecanium* on an alder tree at Catford, and then it was too late to obtain male scales.

There can be no doubt that this is the *Lecanium alni* of Modeer; the special mention of the absence of wool or farinosity shows clearly that it cannot belong to the genus *Gossyparia*, as Signoret puts it (Ess. Cochin., 319). Whether the species is the *Coccus ulmi*, Linn., as I think is probable, is to be proved; *Lecanium alni*, Modeer, is given without any synonym by Walker in his list of British species. *Coccus alni*, Schrank, Fauna Boica, 144, 159, may well be Modeer's species, though it is not cited. De Geer does not notice the *Coccus alni* of Modeer, but he remarks with reference to the scales he found on willow (*C. rotundus salicis*, De G.), that he found some quite similar to them on alder, and he considered them to be of the same species (Mém., T. vi, p. 442).

PULVINARIA CAMELLICOLA, Sign.

On January 29th last Mr. Parfitt sent me from a greenhouse at Exeter a leaf of camellia on the under-side of which were several yellowish, extremely flat, oval scales, but two of them had a slightly raised brownish line down the middle. They were so like the scales of *L. hesperidum* that I deemed they were that species, which is found on many different plants; and having pinned down the leaf so as to prevent its warping, I put them in a box on one side. Looking at the leaf on February 23rd I saw that all the scales except two had dried and become loose. Of the two one remained fixed, and underneath was a developed male, dead and adherent to the scale; the other scale had disappeared, and in its place was a white, slightly convex, smooth, shining scale, which, when I attempted to raise it with a needle, broke and disclosed a male imago alive. The head, eyes, antennæ, thorax, legs, and abdomen were wholly yolk-yellow, the antennæ thickly set with short projecting hairs, the two anal filaments snow-white, the broad wings smoke-white, sub-opaque, the costal area and also the adjacent ordinary nerve faintly tinged with pink.

The male of *L. hesperidum*, and indeed of all the species of that group, being entirely unknown (excepting the very ambiguous *L. lauri*, Boisd.), I hesitated as to the name; since then I am convinced that this is the male of *Pulvinaria camellicola*, Sign., the

description thereof agreeing exactly with my example; and I am the more induced to this belief that in April Mr. P. Cameron of Sale sent me, on a camellia leaf, two ovisacs of *P. camellicola*, ♀ (c.f. vol. xxii, p. 159), to one of which the yellowish scale remained attached, and with them a white scale of the male, precisely like that from which the male insect had emerged in February, but the perfect insect did not now come out, having died *in situ*. Signoret says that the scale of *P. camellicola* greatly resembles that of *L. hesperidum*, but the female of the latter species is viviparous, and so has no ovisac internal or external of the scale.

On May 18th, though too late for male scales, I found several female scales still attached to the peculiar, long, white ovisacs, forming conspicuous objects on the under-side of leaves of camellias, at Mr. Stainton's; so the species does not seem to be uncommon.

8, Beaufort Gardens, Lewisham :

July 10th, 1886.

CATEREMNA TEREBRELLA, ZK.; A *PHYCID* NEW TO THE
BRITISH LIST.

BY LORD WALSINGHAM, M.A., F.L.S., &c.

PHYCITA TEREBRELLA, Zincken.

Germar & Zincken, Magazin d'Entomologie, iii, B. S., 162, No. 33.

This species is No. 598, p. 229, in Staudinger and Wocke's Catalogue of the Lepidoptera of Europe, and is well figured by Herrich-Schäffer, vol. iv, fig. 199, under the name of *Myelois terebrella*. Treitschke, who places it in the genus *Phycis*, quotes a good description of its habits in the larval stage, on the authority of Von Tischer.

On the 26th of July I observed, near the garden here, some small aborted cones on a well-grown tree of *Abies Douglasii*. These cones usually formed part of a group of three or four, the others being fully developed. They were from an inch to an inch and a half in length, and had apparently become dried up and shrivelled before the formation of the seeds or the growth of the woody scales. The first I examined contained a living pupa, which was unfortunately crushed; in the second I found a larva, and, as I immediately recognised that its habits differed from those of *Nephopteryx decuriella*, Hb. (*abietella*, S. V.), I collected as many as I could find, and within the next two days specimens of a *Phycid*, obviously new to the

British list, appeared from amongst them. I at once sent one of these to my friend Mons. Emile Ragonot, whose Revision of the British species of *Phycitidæ* and *Galleridæ* appeared in the last volume of the Ent. Mo. Mag. I quote the following from his answer to my letter:

"It is the *Euzophera terebrella*, Zk., of our list, but the insect has been separated by Meyrick from the true genus *Euzophera*, because veins 4 and 5 are from a point, whilst in *pinguis* they are forked. Mr. Meyrick created the genus *Cateremna* for *terebrella* and an allied Australian species which I have not seen. The larva of *terebrella* has been described by Von Tischer in Treitschke, and he mentions that the cones are aborted. Zeller (Isis, 1848, p. 663) also distinguishes it from another cone-feeder, *Dioryctria decuriella*, Hb. (*abietella*, W. V.). It is an interesting but rather dangerous novelty for the British fauna."

Abies Douglasii, a native of California, has, like other introduced firs and pines near it, been raised from seed, and the particular tree on which this interesting species occurs is one of luxuriant growth about 30 or 35 years old. The spot on which it grows has long been my favourite collecting ground, and has been searched for *Lepidoptera*, in July and August especially, for the last 23 years with few exceptions, probably several times in every season. I can scarcely believe that the species could have been overlooked had it occurred in any abundance in the course of at least the last ten years. Other trees of the same species are found at about half a mile from this spot, but, although one or two aborted cones were present on one of them, no traces of this larva could be discovered. It is sufficiently evident that however destructive the habits of this insect may be elsewhere, it has not yet become a source of danger to fir trees in this country.

For those who have not access to the German works the following description may be found useful:—

Antennæ brownish-fuscous.

Head and palpi greyish-fuscous, the base of the haustellum white.

Thorax and fore-wings brownish-fuscous, interspersed with whitish scales. The most conspicuous markings being an oblique narrow fascia about one-third from the base of the wing, tending outwards to the dorsal margin. This fascia is angulated outwards on the fold and inwards below it. Commencing about the middle of the costa is a conspicuous white patch, which reaches half across the wing, and contains two fuscous spots, the one at its lower edge, the other immediately above it. Below this patch a few white scales are scattered across the wing towards the dorsal margin. Beyond, but separated from it by a brownish-fuscous interspace, less wide than that following the first fascia, is a narrow, waved, white, transverse streak, angulated inwards below the costa, the angle pointing to the upper spot in the white patch, angulated outwards slightly above the middle, and again inwards immediately above the anal angle. Along the apical margin is a row of six or seven brownish-fuscous

spots separated by whitish scales. Fringes grey. On the under-side of the fore-wings a pale costal spot indicates the upper end of the white waved outer line.

Hind-wings shining grey.

Abdomen slightly darker than the hind-wings, anal tuft pale ochreous.

This description is taken from two males, of which the expanse of the wings is 8 lines. I have received from Mons. Ragonot a specimen of the female from Germany, in which the expanse of the fore-wings is 10 lines.

Sufficient time has not yet elapsed to prove whether the larvæ collected in some of the aborted cones in which this *Phycid* has been bred are really those of the same species, but I think there can be little doubt of this, and, in any case, there should be no difficulty in verifying the fact in due time. Several empty pupa cases have been found enclosed in a light silken web surrounding the hollow interior of the aborted cones.

A description of a larva which is now feeding should be easily recognised :—

Head pale brown.

Second segment with an undivided plate or shield slightly paler than the head; the anterior edge straight, posterior edge convex. On each side of the shield on the same segment is a small reniform chitinous spot.

The remaining segments semi-transparent, greyish-white. The dorsal vessel dark grey. The 3rd and 4th segments are traversed by a transverse line of very pale brown slightly tuberculated spots, three on each side of the centre, each of these spots bearing a single delicate whitish hair. The penultimate segment with three small, pale brown, chitinous spots, the middle one being the largest. The last segment is almost completely covered above by a circular chitinous plate of a brownish colour. Segments 5 to 11 have each four slightly tuberculated spots, arranged in the form of a square above, with two more at each side, one beneath the other, opposite to the centre of the segment.

Length, about $4\frac{1}{2}$ lines, when apparently about half-grown.

All the spots are very pale brown, each bearing a single hair.

Merton Hall, Thetford, Norfolk :

August 1st, 1886.

P.S.—Since writing the above I have taken a fine female of *Ca-teremna terebrella*, Zk., flying among common spruce firs, at a distance from the place where I found the larvæ. I have also found traces in aborted cones on common spruce, of a larva feeding in the same manner as those on *Abies Douglasii*. I am inclined to believe that *C. terebrella* will be found to be widely distributed, and by no means uncommon.—*August 18th, 1886.*

A NEW SPECIES OF *BRATHINUS* (*SILPHIDÆ*).

BY GEORGE LEWIS, F.L.S.

In the autumn of 1884, I received from Yezo, through the medium of a Japanese collector I had sent in the previous spring to explore the district of the Ishikari River, a species of the genus *Brathinus*, and as the discovery adds another peculiar and interesting form to the list of insects whose congeners live in what are now, from a physical and geographical point of view, the most divergent of countries, viz., Japan and America, I think it well to offer an independent record of the capture to the Ent. Mo. Mag. Leconte has described in the Proc. Acad. Phil., vi, 1852, p. 157, two species of *Brathinus*, and these, with the Japanese species, are all that are known at present.

BRATHINUS OCULATUS, n. sp.

Elongate, little convex, reddish-brown, smooth and shining. Antennæ with the first seven and the 11th joints brown, 8th, 9th, and 10th white; palpi piceous; legs pale. Head transverse, black; forehead concave; eyes large and prominent, coarsely granulate; neck inconspicuous; thorax smooth, convex, rounded anteriorly, and somewhat elongate behind; elytra very finely punctulate, in colour dark, with the suture narrowly, and lateral margins broadly, pale. Length, 4 mm.

Through the kindness of Dr. Sharp, I have before me examples of *B. nitidus* and *varicornis*, and the chief points of difference I see between the three species are as follows: *B. oculatus* differs from *nitidus* in the three white joints of the antennæ, much more transverse head and prominent eyes, and in the comparatively small and inconspicuous neck. From *varicornis* it differs in having three white joints of the antennæ, instead of two, black head, in the place of brown, with more prominent eyes, and by the elytra being free of setæ. The setæ of the elytra are a salient character in *varicornis*.

I only possess five specimens of *oculatus*, and three are unfortunately in bad condition; in size it is intermediate between *nitidus* and *varicornis*, the last-named being the smallest.

Wimbledon, London:
June 15th, 1886.

On the specific identity of Tephrosia crepuscularia, W. V., and biundularia, Esp.—Some time in the year 1878 my late kind correspondent Professor Zeller wrote as follows:—"I wonder why Staudinger separates these" (*crepuscularia* and *biundularia*), "I deny their specific right, not allowing the time of appearance to prove it. With us both are together, and, moreover, a dark variety." At the same time he sent me dark grey specimens, with a challenge to pronounce as to which they belonged, which, however, I was quite unable to do. As I was at the time

closely engaged in other work, and living, moreover, in a district in which there was little opportunity of studying either form, the matter was deferred ; and recently it has been taken up by others, and some very interesting papers on the subject have been published, but I still think that a little remains to be said.

As I understand it, the alleged distinction between the two species or forms consists in two points :—The *ground colour*, which in *crepuscularia* is brownish, in *biundularia* whitish ; and the *time of appearance*, which in *crepuscularia* is from February to April, according to the season, in *biundularia* May and June. A third point has been put forward, the double broodiness of *crepuscularia* as distinguished from the other, which is said to be single-brooded ; but this is a mistake. I have taken second brood specimens of both forms in July or August, in the south of Surrey, and have them now before me. It can hardly be necessary to point out that this is with very many species a mere question of latitude, species being single brooded in the north, or even in the midlands, which are double, or partially double brooded in the south of England.

As we have these forms in the south then, *crepuscularia*—emerging generally in March or April—has the ground colour *whitish, almost entirely obscured* by lighter or darker brown dots, or by a brownish clouding towards the costal and hinder margins. The first line faintly indicated, brown, and accentuated generally by three black spots situated on nervures. Second line brown, with a black spot at *every* nervure, those in the middle being the most distinct. This line has a duplicate in lighter brown just beyond it, and in this, opposite the two large central spots, is a somewhat square, dark brown, blotch, sometimes conspicuous. Between the first and second lines is a faint brown central shade, darker at the costa, and having two black dots in the middle. Before the hind margin is a third line, broken and disconnected, and having generally two dark brown or black spots *above* the middle. This line has also its duplicate nearer the margin, and there is a black dot in the space between the terminations of the nervures at the base of the cilia which are spotted with brown. Specimens are by no means uniform, but vary in the degree of intensity of all the brown markings, and to some extent in the number of black spots.

Biundularia—emerging in the south, generally in May—may be described in *precisely the same terms*, except that the brown scales are very much fewer, and all the brown markings paler, so that the black spots are more noticeable, but it is quite impossible to find any reliable mark constituting a distinction between them. Every spot, shade, line, and blotch is placed precisely in the same position and proportion, and, under a lens of low power, even the dusting of brown scales differs in nothing but degree.

In the hill districts of the midland and northern counties we come upon quite a different set of forms, but all, or nearly all, seem to agree in this one respect, that the tinge of warm fulvous-brown has disappeared, and is replaced by umber, or, more frequently, by various shades of grey, and in very many the grey becomes so dark as to obscure or even efface nearly all the normal markings. In this last case, however, a narrow space between two of the hindermost dark bands remains pale or even whitish, constituting a character never observable in the normal forms. These more northern specimens are generally a little smaller than those from the south,

and the costa is usually a little straighter, causing the fore-wings to be slightly narrower, so that there would actually be less difficulty in finding characters to separate the midland hill-frequenting forms from those of the south of England, than in differentiating the two southern forms from each other as we have been in the habit of doing. Nobody, however, supposes that there is any ground for doing this, and a careful examination of the different midland forms seems to show that in their variations, according to times of emergence, they do not follow the southern rule. In my own recent visit to Staffordshire I took but one specimen—just out of pupa on June 11th—which, from its time of emergence, should have been *biundularia*, but which actually agreed far better with *crepuscularia*, only differing in the umbreous instead of fulvous character of the brown markings. On June 19th, the Rev. C. W. Thornewill, of Burton, also took a brown-lined specimen, very similar, and these two are the nearest to the southern *crepuscularia* of any midland specimens that I have seen. But previously to this, on May 29th, Mr. Thornewill had taken one whitish and two grey specimens—veritable *biundularia*. Then again the specimens mentioned (*ante*, p. 41) as taken in Derbyshire in April were dark grey with the whitish subterminal line, and others taken in the same place in June, are, some of them, precisely similar, while others vary, darker and paler, some being nearly as brown as the Staffordshire specimens.

Many years ago I, with some difficulty, obtained eggs from specimens of *biundularia* taken at Haslemere, in order that Mr. Buckler might compare and ascertain their points of distinction from those of *crepuscularia*. The larvæ were reared and figured, but Mr. Buckler was so little satisfied with the result that just before his lamented death he was desirous of again rearing both forms from the egg, in the hope of finding characters previously overlooked—a most unlikely result.

Taking all these facts into consideration, it seems to me unreasonable to attempt to keep up the purely artificial distinction between these two forms. They should surely be united under the name of *crepuscularia*, W. V.

If we admit that these forms constitute but one species, we are still confronted by the remarkable phenomenon, for which no reasonable explanation seems to present itself, that two races exist in the same localities, emerging at different periods, and presenting a constant difference in the shade of colour. We know that the *biundularia* which emerge in May, are not the offspring of the April *crepuscularia*, and, as far as investigation has gone, we find that the offspring of each form emerges at the same time as its parents, and presents the same characteristics—setting aside the few which feed up quickly and emerge the same season, and exhibit similar characters in a modified form. We have, in fact, a curious instance of dimorphism in both sexes.—CHAS. G. BARRETT, 68, Camberwell Grove, S.E.: July 22nd, 1886.

Cidaria immanata : variety of the larva.—On August 25th, 1885, Mr. C. G. Barrett sent me from Belfast eggs of this species; I kept them through the winter out-of-doors on growing moss in a flower pot, and at the end of March, 1886, I found four larvæ just hatched; the rest died in the egg; the first of the four larvæ spun up on 18th May, the last on 5th June; the first moth appeared 11th June, the fourth 26th June; all through, these examples agreed with previous descriptions, except in one particular; one of the larvæ as it grew large showed a *subspiracular*

purplish-pink stripe; this was not so deep in tint or so wide in extent as I have often seen it in examples of *russata*, still it was very plain, and caused me some surprise, because it had never been before recorded in this species out of the large numbers of larvae which have been reared.—J. HELLINS, *August 10th, 1886.*

Papilio Machaon at Herne Bay.—A specimen of this butterfly in fair condition was captured by myself last week between Herne Bay and Whitstable; a record of this may perhaps interest some of the Lepidopterists.—MARTIN JACOBY, Herne Bay: *August 16th, 1886.*

Notes on the life-history of Scotosia undulata and Hypsipetes impluviata.—*Scotosia undulata*:—Having found the larva of this species during the last two or three seasons, I am able to detail a little of its life-history, which, perhaps, is not generally known. The description of the larva given in the “Manual,” though brief, is essentially correct. In consequence of the great beauty of single specimens, which I had from time to time casually bred, I was induced to make a special search for larvae in 1884, and I am glad to say the search was so far successful, that I managed to secure sufficient larvae to enable me to rear a nice series of about a score. Those who have not yet found the larvae where the species occurs may do so with little trouble. At the end of August or beginning of September, according to the apparent lateness or earliness of the season, the larva is about one-third or more grown, and is then to be found feeding in a silken web on the upper surface of leaves of sallow. It feeds within this network, and only quits it when the leaf is nearly consumed, nothing but the principal veins, the midrib, and petiole or leaf-stalk being left. Sometimes, and, indeed, most frequently, immediately after a meal it fills up the space occupied by the portion of the leaf just consumed with silken webs. Several leaves are treated in this way, so that the larva is by no means difficult to find. As the larva advances in size, and invariably after the last moult, it is even easier to detect, as it then spins two or three leaves together. It now feeds principally upon the apical portions of the leaves it has spun up, but, so far as I have observed, allows the end of its habitation to remain perfectly open. The larva is always sluggish, and is full-grown here about the middle of September, when it descends below the moss to the surface of the soil, where it constructs a cocoon of earth and silk, pupates and emerges at the end of the following June.

Hypsipetes impluviata:—I have reason to believe that the larva of this species shows a decided preference for the *withered* leaves of alder, upon which it feeds. Probably it prepares its food by biting through or partially through the leaf-stalk, thus causing the leaf to decay.—EDWARD A. ATMORE, King's Lynn, Norfolk: *August 13th, 1886.*

Note on the larva of Zelleria hepariella.—While searching for the larva of *Gracilaria semifascia* at Box Hill the beginning of this month, I noticed, by the side of the maple I was examining, a small ash tree, on one of the leaves of which was a white silky cocoon. Putting this into a tin box and continuing my search, I succeeded, after some considerable time, in finding five more pupæ and several larvae. Thinking it very probable they were the larvae of *Z. hepariella* I searched other ash trees in the vicinity, but although I looked very carefully no more were to be found;

I saw many leaves where they had been feeding, but all the larvæ had disappeared, no doubt to pupate in some suitable place, so that I was evidently just too late for them. However, I had sufficient for my purpose, which was to try and breed them and so ascertain what they really were. They all spun up the next day, some on the leaves and some among the rubbish at the bottom of the cage. They all made pure white cocoons very similar to those of a *Swammerdamia*. On the 17th of July the first imago appeared, a most beautiful deep orange coloured specimen, and two more the following day. I was much pleased to see they were as I had expected, *Zelleria hepariella*.

The larvæ are rather slender, tapering towards each end, of a light transparent green colour, with very dark dorsal line; head yellowish-brown; legs yellow; extremely nervous and timid, dropping from the food at the slightest touch. They feed in the shoots, or tips of the leaves, drawing them together by a slight web and gnawing them into large holes; they are full-fed the end of June, the imago appearing the middle of July.—GEO. ELISHA, 122, Shepherdess Walk, City Road, N. : July 19th, 1886.

Zelleria hepariella.—This insect was bred by me more than a third of a century ago, and it is only now that I begin to suspect where I obtained the cocoon whence the moth emerged on the 27th July, 1852. The fact that I had bred the species was noted by me in the "Entomologist's Companion," 2nd Edition, p. 60, and in the "Insecta Britannica; Lepidoptera Tineina," p. 192, where I remarked of the only three species of the genus then known (*hepariella*, *insignipennella* and *fasciapennella*); "the larvæ of none of them are known, though (to my shame be it said) I have myself bred *hepariella*, but have no recollection of the larva; in the cage in which I bred it was an ash-leaf, that had evidently been eaten; it emerged from its thick white cocoon on the 27th July, 1852 (the day on which Prof. Zeller finished his visit to England)." I also recorded this same event in the 11th vol. of the "Natural History of the Tineina," p. 94, but it always remained a mystery.

Professor Zeller was 15 days in England in July, 1852, and was naturally eager to see as many of our collecting localities as possible in the short time he was here; we went to Charlton sand-pit, to West Wickham Wood, to Mickleham and to Sanderstead.

We were at Mickleham on the 18th July, and I have now no doubt the ash-leaf, with the white cocoon, which produced so unexpectedly *Zelleria hepariella*, was picked then and there.

Guided by Mr. Elisha's experience, recorded above, a ray of light has dawned upon me, and the locality (hitherto *a terra incognita*) for my ash-leaf seems revealed.

The cocoon may be compared either with that of a *Swammerdamia* or that of an *Argyresthia*; in all the three genera the larvæ spin thick white cocoons.—H. T. STANTON, Mountsfield, Lewisham, S.E. : August 10th, 1886.

Description of the larva of Gelechia vilella, Zell.—In the Eat. Mo. Mag. for February last (vol. xxii, p. 212) I recorded the breeding of *Gelechia vilella*, Z., in 1870, from larvæ collected full-fed on the Essex coast in the July of that year. I am now able to give some account of the young larva and its mode of feeding.

Early in June the unexpanded flower buds of the common mallow were found to be tenanted by a very small white larva. A bagful of these buds was thereupon collected, and in a short space of time hundreds of minute larvæ appeared, escaping by burrowing through the linen bag. A few, which were already full grown, and had spun up within the bag, were found to have been devoured by these hosts of voracious youngsters. At the beginning of July, however, on revisiting the locality, I observed the full-fed larvæ crawling about in numbers on the fences and walls; collected at this stage they soon pupated and produced the imago in due course.

The young larva of *vilella* is white, with the usual spots small and indistinct; it narrows off very rapidly towards the tail, but has the head and anterior segments remarkably broad. The head itself and the 2nd segment are shining black; *the 3rd segment is bright chestnut-red*. As the larva approaches maturity, the ground-colour becomes pinkish, and when full-fed deep, dull pink, while the bright red of the 3rd segment fades, until it is scarcely perceptibly darker than the rest of the body. The spots are then large and brownish. Feeding when young in the flowers and unopened flower-buds, but afterwards in the unripe seeds of the mallow; when full-fed leaving the food-plant and spinning up among rubbish in a slight, but strong, white cocoon. Before doing this, the larvæ wander a long distance and often ascend the walls of houses, where they apparently pupate under the shelter of the eaves. In confinement I find they spin up readily in the inside of sheets of wool. The pupa is light brown, and, *at first*, very tender. As in many places the mallow plants are almost entirely stripped of flowers and seeds by the extraordinary multitude of feeding larvæ, this wandering propensity observable in those about to pupate may be due to an instinctive desire to escape from the cannibal jaws of their still hungry juniors. The imago appears very sluggish, sitting close on the ground, and refusing to fly when disturbed.

It may be worth while to note the points of similarity and difference between this species and *malvella*. The imagoes are both of the same size and build, the same dull brown colour, the same sluggish retiring habits. *Vilella* may be distinguished by the small black spot near the base of the inner margin; *malvella* by the dark fascia towards the apex. The larvæ both feed on allied plants, and more or less in the same fashion, eating out the seeds; but while *vilella* feeds in June and July, emerging in August, and hibernating as imago lays its eggs in spring, *malvella* feeds up in August and September, hibernates as larva in a cocoon, and then, after spinning a fresh cocoon in spring and pupating therein, emerges in July. The larva of *malvella* feeds in nature on *Althaea officinalis*, and in gardens on hollyhocks (*Althaea rosea*); that of *vilella* attacks *Malva sylvestris*.

I should add, that though occurring in the larval state in great profusion, *Gelechia vilella* yet appears to be very local. I can find it for about a mile along the coast, wherever the food-plant grows; but beyond this distance, though the mallow is equally abundant, there is no trace of the larva.—W. WARREN, Cambridge: August 20th, 1886.

Note on Miridius quadrivirgatus, Costa.—On July 16th, 1884, I found this species in great abundance by sweeping long grass and mixed herbage in a lane bordered by dykes at Deal; it appeared to be very local, about four square yards

being the limit; it, however, took flight with great rapidity. On the 3rd of this month I was surprised to sweep it up at Dover, in the mixed herbage at the side of a path leading through a corn field; it, however, was not so common or so local as at Deal. Specimens occurred at a considerable distance from each other. Messrs. Douglas and Scott (British Hemip.-Heterop., p. 301) give the dwarf swallows at Deal as the habitat, but I have not found it near the swallows, and there are no dwarf swallows or any species of swallows on the dry chalky fields on the cliffs of Dover. Is it possible that they may be found on any low growing plant by the sea?—C. G. HALL, Dover: *August 4th, 1886.*

Oxygastra Curtisi, Dale, in Hampshire.—In the September number of this Magazine for 1878 (vol. xv, p. 92), I recorded the capture of six specimens of this dragon-fly on a heath lying to the north of Pokesdown, near Christchurch, Hampshire. I visited the same locality in June, 1882, but saw no specimens of this species. On the 14th inst. I again visited this heath, and found four specimens, all males. The extremely local character of this species is evident from the fact that, except on the heath in question, I have never seen it alive, either in this neighbourhood or elsewhere in the United Kingdom; nor has either Mr. Kemp-Welch or Mr. McRae, of this town, ever met with the species, although they are well acquainted with the district, and have collected in it for some years past insects of all Orders.—H. Goss, Bournemouth: *July 28th, 1886.*

The genus Dilar in France.—In the first half of July in this year I was the guest of M. René Oberthür, at his charming chalet at Vernet-les-Bains, in the Pyrénées Orientales. It was my first introduction to a district almost Spanish, both in productions and position. The detailed results in *Neuroptera* I hope to publish hereafter. The 12th and 13th of the month were devoted to a long and sufficiently arduous excursion to Mount Canigou, near the summit of which we enjoyed (?) a few hours rest in a stone cabin. The descent was commenced at about 5 a.m. on the 13th, and, in consequence of entomological vagaries (opposed to the steady marching of mere alpine climbers), Vernet was not reached till late in the afternoon, and one of us was very sleepy. At a locality known locally as the "Col du Cheval Mort," which is hot, arid, and argillaceous, I "bottled" a Neuropterous insect at rest on a leaf of *Asclepias vincetoxicum*. I did not recognise it, even generically, at the time, but it proved to be a ♂ *Dilar*, which I identify as *D. meridionalis*, Hagen, and of which I possess specimens from San Ildefonso (Old Castile) in Spain, given me by Mr. Albarda, a very interesting addition to the French fauna, and interesting, also, as throwing light upon the geographical distribution of the genus *Dilar*. I have been precise in narrating the circumstances of the capture; the habits of *Dilar* are unknown. But my suspicions lie in the direction of the larva being parasitic in the nests of some insect, in consequence of the long and slender ovipositor of the ♀. This can only be solved by local observation.—R. McLACHLAN, Lewisham, London: *August 11th, 1886.*

Ascalaphus hispanicus, Rambur, in France.—This is another interesting addition to the French fauna. I did not meet with it myself, but a pair (♂♀) were taken

by M. Oberthür at quite the end of June, at St. Martin de Canigou (Pyrénées Orientales) in company with *A. coccatus*. The last-named species, and *A. longicornis*, are abundant near Vernet, but not together. Four species of true (restricted) *Ascalaphus* are now known to inhabit France, viz.:—*A. coccatus*, *longicornis*, *ictericus*, and *hispanicus*, and as *A. baeticus* is known from Catalonia, its discovery in the Pyrénées Orientales may be looked upon as almost certain.—ID.

Note on Phyllotreta melana, Ill.—*Phyllotreta melana* has been extremely destructive in this neighbourhood during the present year. I first noticed it towards the end of March, when a few specimens were resting upon the leaves of autumn-sown cabbages which had passed through the winter. To these it did little or no damage, as the plants were sufficiently large and strong to bid defiance to its attacks. But a fortnight or so later, when the first spring sowing of cabbages began to appear above the ground, the beetle increased greatly in numbers, and from that time until the day upon which I write, I have seldom passed through the garden without noticing it in abundance.

The damage which it has caused has been very considerable; throughout almost the whole of the surrounding district the first-sown cabbages, brocoli, and cauliflowers were more or less severely injured, and in some cases completely destroyed. In our own garden, perhaps some twenty plants survived out of eight or ten rows. Later on the seedling kale was attacked in a similar manner, the leaves being riddled as though a heavy charge of small shot had been fired through them, and successive sowings of other brassicas have also been greatly injured, although in a less degree. At the present moment the beetle is as abundant as ever, even upon hearting cabbages.

With regard to *Ph. nemorum*, Curtis states that there may be five or six broods in a season. *Ph. melana*, to judge by my own observations, seems to follow no rule upon the subject, but breeds continuously, without reference to regularity. I do not think that I have once examined the infested plants without noticing a number of pairs *in copula*; and certainly the beetle has never disappeared from the garden, even for a couple of days together.

A professional gardener of some local celebrity tells me that the insect in question is also destructive to broad beans. This, however, I cannot believe. I have had beans and cabbages growing in alternate rows upon the same plot of ground, and a most careful search, repeated upon more than one occasion, has resulted in the discovery of two specimens only upon the former; and these, no doubt, were accidental visitors only, which had sprung from their food-plant at the vibration of an approaching footstep. And the leaves of the beans show no traces of the "riddling" which is so conspicuous in the cabbages. I rather fancy that the gardener in question, unobservant after the manner of his race, has confused the *Phyllotreta* with *Sitones lineatus*; a strange mistake, perhaps, but one of far less magnitude than many which are prevalent among the agricultural classes.

It is perhaps scarcely necessary to say, that only the young plants are seriously injured by the beetle; these, however, are frequently destroyed while still in the seed-leaf. At least one-third of the cabbages, kale, &c., sown in the garden this year have thus been killed, and I have reason to believe that others in the neighbourhood have suffered more severely than myself. I do not think that *Ph. melana* is

generally abundant; I have never taken it in any numbers elsewhere. But in this neighbourhood it is certainly by far the most plentiful and mischievous species of the genus.—THEODORE WOOD, St. Peter's, Kent: *June 28th, 1886.*

Langelandia anophthalma, Aubé, at St. Peter's, Kent; a species of Coleoptera new to Britain.—I have great pleasure in recording the capture of this most interesting addition to our Coleopterous fauna, having taken some twenty examples in the garden here from decaying seed-potatoes. I first met with the insect, then quite unknown to me, in May, and am still taking it occasionally at the date of writing.

It has been suggested to me that the beetle may possibly have been imported with foreign grown potatoes, and so be a semi-naturalized foreigner rather than an indigenous species. On making enquiries, I find that the seed in which the greater number of specimens have occurred came from Guernsey—a fact which seems rather to favour that supposition. But, on the other hand, I have taken several examples from potatoes raised by myself last year from English seed, and accidentally left in the ground during the winter; and, as the first of these occurred early in May, barely a month after the Guernsey seed was planted, and at a distance, moreover, of some twenty feet away, there can be little doubt that the beetle was present in the ground before the potatoes.

Upon the Continent, *Langelandia* seems to be generally taken in buried logs, or beneath boards, &c., lying upon the ground. Du Val, in his "Génér. des coléoptères d'Europe," says of it:—On le trouve principalement sur les pièces de bois plantées dans le sol, ou sous les vieux tonneaux, les vieilles planches, &c., placés depuis longtemps dans les jardins." But I am convinced that it would be found far more plentifully in decaying seed-potatoes if carefully searched for at the time of lifting the crop; and it is more than probable that other captures of interest would be made at the same time. So far, I have taken in this manner three or four hundred specimens of *Adelops*, fifty or sixty of *Anommatus*, and twenty of *Langelandia*, besides such species as *Falagria thoracica* and *Oxytelus insecatus* in greater or less abundance.

The most productive seed is that which is partly decayed only, and which is moist without being wet; potatoes reduced, as often happens, to a semi-liquid pulp will yield little or nothing. Great care, however, is always necessary in the examination, for both *Anommatus* and *Langelandia* are exceedingly sluggish, and harmonize in colour so well with their surroundings that they might well be passed by unnoticed.

In form and size *Langelandia*, although a member of the *Lathridiidae*, is very similar to *Ditoma crenata*, from which it can be at once distinguished by the three bold ridges which run longitudinally along the thorax and elytra, by the uniform dull reddish-brown colour, and by the total absence of eyes. It can scarcely be confounded with any other British species, and any collector fortunate enough to meet with the insect will find little difficulty in identifying his capture.—ID.: *August 9th, 1886.*

On the British species of the genus Agenia, Schiödte.—Hitherto our list of British Hymenoptera Aculeata has included only two species of *Agenia* with banded wings, viz.: *variegata*, Linn., and *bifasciata*, Fab., whereas on the continent two other species occur, *hircana*, Fab., and *intermedia*, Dahlb. Until quite lately, I never had any doubt as to our British species being correctly named, they were

easily distinguishable, the ♀ of *bifasciata* having the metathorax punctured, while that of *variegata* was transversely rugose, but during last month, Mr. R. C. L. Perkins, of Sopworth, near Chippenham, captured several of an *Agenia* with punctate metathorax, of which he has sent me specimens, which certainly neither agree with the description given by Dahlbom or Thomson of *bifasciata*, nor with the ♀ of that species which I possess myself, and from which I drew up the description in my synopsis. I think it is also certain that they are referable to *hircana*, Fab., as described by Dahlbom and Thomson. The male may be known by the shape of the apical ventral segment of the abdomen, which is much compressed laterally, as in *variegata*, but looked at sideways is somewhat hatchet-shaped, its base depending almost perpendicularly from the level of the preceding segment. The ♀ may be known by its shining metathorax, and its small size, which is rather less than that of *variegata*.

The question which arises now is, have we three species indigenous to this country, or only two; from what I can see, I am inclined to think that both Shuckard and Smith have described *hircana* under the name *bifasciata*. Dahlbom (Hym. Eur., i, p. 88) refers Shuckard's *bifasciata* to his *hircana*, without doubt, and, from the size given, and the mention of the shining metathorax, I have no doubt he is right: and for the same reasons I believe that Smith's *bifasciata* is referable to *hircana* also.

If we thus dispose of *bifasciata*, of Shuckard and Smith, as a synonym of *hircana*, Fab., I am afraid the claim of the true *bifasciata*, Linn., to a place in our list will rest on my own single female: this specimen came from my father's collection, and bears the small blue ticket, by which he always indicated his British specimens; there is no note of locality, and in a general collection like his, where British, continental, and exotic species were all together in one arrangement, one cannot but foresee the possibility of a ticket being detached from the pin of an English specimen, and accidentally attached to another's, perhaps of continental origin; so that, although I much regret it, I think we must wait for further evidence to accept *bifasciata* as a British species, and be content at present with *hircana*, Fab., = *bifasciata*, Shuck., Smith, and *variegata*, Linn. It is quite likely, however, that *bifasciata* may turn up, as it occurs in Sweden, in Germany, in Belgium, and in France.—EDWARD SAUNDERS, St. Ann's, Mason's Hill, Bromley, Kent: *July 12th, 1886.*

Reviews.

FOURTH REPORT OF THE UNITED STATES ENTOMOLOGICAL COMMISSION. The COTTON WORM, together with a chapter on the BOLL WORM. By CHARLES V. RILEY, Ph.D.; Washington, Government Printing Office. Pp. xxxviii and 399; Appendices and Index, pp. 147, with numerous engravings, two maps, and 64 plates, 8vo, 1885.

That Prof. Riley is "nothing if not thorough" goes without saying. The Report is a masterly monograph, classificational, bibliographical, anatomical, and agricultural. We might, from a reviewer's point of view, complain of its bulk, but those specially interested must endeavour to apply themselves to the particular portion that concerns them. The "Cotton Worm" (which it appears should bear

the name *Aletia xyloina*, Say) occupies fifteen of the sixteen chapters, chap. 17 being devoted to the "Boll Worm" (*Heliothis armigera*; also a Cotton Worm); the Appendices mainly concern Reports from various assistants, and extend to Brazil, Central America, and the West Indies. Most of the chapters are from Prof. Riley's own pen; but chap. 5, devoted to anatomy, is by E. Burgess and C. S. Minot; chap. 6, on "the Cotton Belt," by Prof. E. A. Smith; and chaps. 11-13, on machinery, &c., devised for distributing destructive agents, are by Prof. W. S. Barnard, and the plates from 14 inclusive concern the same subject. The two folded maps are respectively explanatory of the physical conditions of the area occupied by cotton cultivation in the States, and of the proportion that cotton bears to other crops. The chapters treating on destructive agents, which are mostly "Paris Green," "London Purple," Kerosene, and *Pyrethrum*, should be consulted by all interested in Economic Entomology in all countries, and for nearly all crops. It is the duty of a physician to cure disease or to prolong life; so also is it the duty of an economic entomologist to endeavour to save the crops of the agriculturist from attacks of insect-enemies. We leave the question of over-production to the consideration of the political economist.

SECOND REPORT ON THE INJURIOUS AND OTHER INSECTS of the State of New York. By J. A. LINTNER, State Entomologist. Albany, 1885, 8vo, pp. 262.

We like this Report. If less bulky than those issued for some others of the States it has the merit of clearness, and absence from a superfluity of red-tape matter of little interest to the general reader; nevertheless, the subjects treated upon are very numerous, so numerous that we cannot even mention them in a condensed form; and all are treated upon in a practical, as well as in a scientific manner. The author is an unrelenting enemy of the English sparrow, which he condemns as being one cause of the increase of caterpillars, because it drives away the native birds that feed upon them, and does not perform that useful office itself. The illustrations are characteristic, but there is a coarseness about some of them. The index is very full. A useful feature is a reprint of a scarce paper by the late A. A. Fitch who so long held the position of State Entomologist for New York.

THE LEPIDOPTERA OF DORSETSHIRE, or a Catalogue of the Butterflies and Moths found in the County of Dorset. By C. W. DALE. Dorchester, Henry Ling; London, Trübner and Co. Pp. xiv and 90, 8vo, 1886.

This is, probably, one of the most complete lists of its kind that exists, and so it should be, the name of Dale having been so intimately connected with the Entomology of the County of Dorset for two generations, and for nearly the whole of the present century, and latterly the author has had valuable assistance from the Rev. O. P. Cambridge, the Rev. C. R. Digby, Mr. E. R. Banks, &c. Taking the number of British species at 2095, 1302 are enumerated as having been found in the County, a very large proportion. An appendix is devoted to notable species in other orders that have been recorded from the County, which is divided into six divisions on account of physical and other features. The short introduction is readable, but, perhaps, the first paragraph might have been advantageously omitted. The work is of antiquarian interest from an entomological point of view. We read that *Papilio Machaon* (formerly plentiful) has not been taken at Glanville's Wootton since 1816; *Apatura Iris* not since 1840; *Vanessa c-album* not since 1816; *Melitaea Artemis*

not since 1841; *Lycaena Acis* not since 1839; and so on. The book is nicely got up, and is comparatively free from typographical errors. Probably no other County can boast of having possessed a resident entomologist who commenced his diary in 1808, and continued it until the day of his death in 1872; such was the case with the late Mr. J. C. Dale.

ENTOMOLOGICAL SOCIETY OF LONDON, *August 4th, 1886*: Prof. J. O. WESTWOOD, M.A., F.L.S., Hon. Life-President, in the Chair.

The following were elected Fellows, *viz.* :—Lord Dormer, Mr. J. H. A. Jenner, Mr. James Edwards, Mr. Morris Young (formerly Subscribers), Mr. F. V. Theobald, of St. Leonards-on-Sea, Mr. E. A. Atmore, of King's Lynn, Norfolk, and Mr. William Saunders, of London, Ontario, Canada, President of the Entomological Society of Ontario.

Mr. Theodore Wood exhibited and made remarks on the following *Coleoptera*, *viz.* :—An abnormal specimen of *Apion pallipes* (Kirby), with a tooth upon the right posterior femur; a series of *Langelania anophthalma* (Aubé) from St. Peter's, Kent, taken in decaying seed potatoes; a series of *Adelops Wollastoni* (Janson), and *Anommatus 12-striatus* (Müll.), also from decaying seed potatoes; and a series of *Barypeithes pellucidus* (Boh.), from the sea-shore near Margate. Mr. Wood also exhibited, on behalf of Dr. Ellis, of Liverpool, a specimen of *Apion annulipes* (Wenck.).

Prof. Westwood exhibited five specimens of a species of *Culex*, supposed to be either *C. cantans* or *C. lateralis*, sent to him by Mr. Douglas, who had received them from the Kent Water Works. It was stated that they had been very numerous in July last, and that persons bitten by them had suffered from “terrible swellings.” Prof. Westwood also exhibited galls found inside an acorn at Cannes in January last.

Mr. Billups exhibited a male and female of *Cleptes nitidula* (Latr.), taken in copulū in July last, at Benfleet, Essex, on the flowers of *Heracleum sphondylium*. He stated that it was probably the rarest of the twenty-two known species of British *Chrysidae*; it had been recorded from the New Forest and from Suffolk. Prof. Westwood, the Rev. W. W. Fowler, Mr. Fitch, and Mr. Champion, made some remarks on the species.

The Rev. W. W. Fowler announced that a series of specimens of *Homalium rugulipenne* (Rye) had been received from Dr. Ellis, of Liverpool, for distribution amongst members of the Society.

Mr. White exhibited a group of three specimens of *Lucanus cervus*, consisting of a female and two males. The female was in copulū with one of the males, which, while so engaged, was attacked by the second male.

Mr. E. A. Fitch read a paper, communicated by Mr. G. Bowdler Buckton, “On the occurrence in Britain of some undescribed *Aphides*.” The paper was illustrated by coloured drawings.

Prof. Westwood read a paper “On a tube-making Homopterous insect from Ceylon.”

Mr. Theodore Wood read a paper “On *Bruchus*-infested Beans.” A discussion ensued, in which Prof. Westwood, the Rev. W. W. Fowler, Messrs. Weir, Fitch, Trimen, and others took part.—H. GOSS, *Secretary*.

SOME NEW FACTS CONCERNING *ERISTALIS TENAX*.

BY C. R. OSTEN-SACKEN, HON. F.E.S.

In the Trans. Ent. Soc. Lond., 1884, p. 489, I called attention to the sudden appearance of *Eristalis tenax* in all parts of the United States. Till 1875 this fly was not known to occur in North America; two years later it was common in Boston; it is now called "common" and "very common" in local lists from Montreal, Canada (Caulfield, Can. Ent., 1884, p. 138), and Philadelphia (E. L. Keen, *l. c.*, p. 146), and it has been received from all parts of the United States, including California, New Mexico, Oregon, and Washington Territory.

Two explanations of this sudden invasion were possible (I quote from my article): " *E. tenax* may have been imported from Europe in ships to one of the harbours of the Atlantic. But if this importation happened long ago, it would have been noticed earlier; if it has taken place recently, it leaves unexplained the almost simultaneous appearance of the fly in Georgia, Missouri, Illinois, and even on the Pacific coast. The other possible explanation is, that *E. tenax*, like some other European species (*Syrphus pyrastri*, for instance), was indigenous on the western side of the continent only, and that it began to spread eastward since civilization in its westward progress came in contact with the area of its occurrence. . . . *E. tenax* may have reached Missouri and Illinois years ago without being noticed; it attracted attention as soon as it appeared on the Atlantic coast, where Dipterologists could recognise it."

Soon after the publication of my paper, I came into possession of a fact which confirms the second of the two hypotheses, the immigration of *E. tenax* from the west. The American Dipterologist, Dr. S. W. Williston, of New Haven, wrote me "that he had seen a specimen of *E. tenax* hidden among a lot of duplicates in Prof. Riley's collection, bearing a label St. Louis, August, 1870;" he added, "that upon drawing Prof. Riley's attention to the fly (which the latter did not previously know by name), he was assured that the species had long been familiar to him about outhouses in St. Louis."

The surprising rapidity with which *E. tenax* spread along the Atlantic coast soon after its first appearance renders it probable that it cannot have existed in St. Louis very long before 1870; otherwise, it would have reached the Atlantic sooner. We are thus driven to accept the following outline of its history. We know that it exists in Japan and Eastern Siberia; from there it must have immigrated into the North American Pacific coast, perhaps long ago. It did not spread

eastwards at once, because the necessary conditions for its existence were wanting on the immense plains it had to cross, just as the Colorado beetle lived in the Rocky Mountains on *Solanum rostratum*, and did not spread eastwards until civilization brought the potato plant (*Solanum tuberosum*), and thus bridged over for that beetle the distance between its native mountains and the Atlantic coast. The condition which civilization brought and which favoured the rapid eastward progress of *E. tenax* consisted in the drains, sewers, and cesspools, those necessary concomitants of crowded centres, and the usual abodes of the larvæ of *Eristalis*.

If we accept this train of reasoning, and I do not see any escape from it, we must carry it further, and admit that *E. tenax* is a companion of civilization, and becomes common with its diffusion only. In early times, when there were no drains and cesspools, *E. tenax* must have been much less common. We have a parallel case in the gradual diffusion of *Teichomyza fusca*, which became common in cities with the introduction of certain modern improvements in cleanliness (compare its history in the paper by Dr. Laboulbène, Ann. Soc. Ent. Fr., 1867, p. 33).

At this point another, apparently very distinct subject, forces itself upon our attention. It is well known that the ancients believed that carcasses of dead animals (especially oxen) produced bees. Virgil, in the Georgics (iv, 285) speaks about it; even modern authors like Aldrovandi (De Anim. Insectis, p. 58, edit. 1602) and Moufet (Theatr. Insect., p. 12, 1634) relate the most wonderful stories: "Aiunt ex horum cerebro gigni reges et duces, ex carnibus vero apum vulgus. Nascuntur item reges ex medulla spinæ, tamen ex cerebro nati pulchritudine, magnitudine, prudentia et robore aliis antecellunt, etc." (Moufet, l. c.*). Lion's carcasses are also spoken of, and the passage in the Book of Judges xiv, 8, refers to a similar case: "And he (Samson) turned aside to see the carcass of the lion; and behold, there was a swarm of bees in the body of the lion, and honey," etc., the honey, of course, being a stretch of imagination.

Now, in all these cases, what were mistaken for bees must have been species of *Eristalis*. Even nowadays *E. tenax* is frequently taken for a bee by non-entomologists. Such occurrences are less familiar to us than to our forefathers, because carcasses are not left lying about now as they were before. But a case in point has been observed by Zetterstedt in Lapland (Dipt. Scand., ii, p. 666). He saw *Eristalis anthophorinus* swarming round the carcass of a sheep: "Ad cadaver ovis putridissimum, aquæ stagnanti maximam partem immersum

* Chap. iii, "De creatione, generatione, et propagatione Apum." Digitized by Google

odore foetidissimum, individua 7 vel 8 feminea sono pipiente celerrime circumvolando congregantia et in cadaveris parte supra aquam elevata interdum sedentia die 16 Junii in Lapponia observavi, ova in cadavere sine dubio depositura." The presence of a pool of putrid water is probably an indispensable condition for the development of the larvæ in such cases.

I do not know whether this explanation of the antique superstition has been offered before. My friend, Geo. H. Bryan, Esq., B.A., in Cambridge, published it, upon my communication, in *Science Gossip*, Nov., 1885, p. 242.

As to the diffusion of *E. tenax* over the American continent, two principal results must be kept in view: first, that it took place *overland*, and that this fly was not carried across the Atlantic during four centuries of intercourse (it will be interesting in this respect to watch whether it will ever be imported into distant islands, like New Zealand, St. Helena, &c.); secondly, the incredible rapidity with which it spread over the Atlantic States, as soon as it found access to the conditions necessary for its larval existence.

Heidelberg: *August*, 1886.

A LUMINOUS INSECT LARVA IN NEW ZEALAND.

BY G. V. HUDSON.

Referring to your request for further information on the luminous larva mentioned in Mr. E. Meyrick's paper, which appeared in the April number of your Magazine (*cf.* Vol. xxii, p. 266), I have much pleasure in forwarding you a brief account of my observations on the insect, which, although not so exhaustive as might be desired in a case like this, are quite sufficient to corroborate your surmises at the conclusion of his paper.

This larva, as Mr. Meyrick remarks, may be found in damp, overgrown gullies, where it is tolerably common, in fact, I have noticed as many as a dozen at a time, but never in such numbers as Mr. Meyrick alludes to; indeed, such a sight would be absolutely dazzling, as the light from a single individual kept in a caterpillar-cage may be seen streaming out of the ventilators at a distance of several feet. When carefully examined with a pocket-lens, this light is found to proceed from a large glutinous knob situated at the *posterior* extremity of the larva, a fact I have verified by repeated investigations. The insect inhabits irregular cavities in the bank, where it hangs suspended in a

glutinous web, which also appears to envelope its body, large quantities of sticky mucus being periodically shot out of the mouth and formed into threads as required, but I have never seen anything like a net extended in front of the insect, neither have I found flies or gnats detained in the webs, although I have examined a large number. At the back of this irregular chamber the larva constructs a small hole, into which it retreats with great rapidity when alarmed. With regard to its food, I am unable to speak with absolute certainty at present, but have little doubt that it consists of decaying vegetable matter. One individual I kept alive for eight weeks was enclosed in a small jar of mud taken from its native bank and placed in a caterpillar-cage where no flies or other small insects could possibly be obtained; as, however, there were some small earthworms in the mud it might have subsisted on these; although I examined the insect nearly every night and morning, I never saw it eat anything.

The light is not shown by any means regularly. On several occasions there was no light all the evening, and then a brilliant display at four or five o'clock in the morning, but I have not noticed any peculiar meteorological conditions to influence this. I do not think Mr. Meyrick's explanation of its use can be entertained, as I am sure every one who has attracted insects at night will know how inadequate such a minute point of light would be to fetch them from any distance. If I might be allowed to suggest a use, I think it may often assist the larvæ in escaping from enemies, as when disturbed they nearly always gleam very brilliantly for a few seconds afterwards, suddenly shutting off the light and retreating into the earth. Of the pupa-state I am quite ignorant, as I have only reared a single specimen, which I unfortunately did not observe while in that condition; but, with respect to the imago, I may say with the fullest confidence that it has no manner of relationship to the *Staphylinidæ* or indeed to any other Coleopterous family, being, in fact, a small "gnat," apparently one of the *Tipulidæ*, and, as it is perhaps undescribed, I forward the specimen for examination by a systematic Dipterist. Why it has been regarded as Coleopterous I cannot understand, as it does not materially differ from numerous other Tipulidous larvæ abounding in rotten wood, etc., throughout the country.

Ghuznee Street, Wellington, N.Z.:

July 15th, 1886.

[Mr. Hudson is correct as to the systematic position of the insect he has forwarded. We submitted it to Baron Osten-Sacken, who

kindly informs us that it is a Limnobia of the genus *Trimicra*, O.-S. The genus is cosmopolitan; it has already been received from New Zealand. There is a notable discrepancy in the two accounts. Mr. Meyrick says the light proceeds from "the back of the neck," Mr. Hudson from the "posterior extremity." We earnestly ask for specimens of the larva preserved in alcohol, or mounted in balsam as a microscopic slide. In connection with luminous *Diptera*, we call attention to Baron Osten-Sacken's notes in Ent. Mo. Mag., xv., p. 43.—
EDITORS.]

ON THE PRETTY NEW SPECIES OF *GELECHIA (NANNODIA)*,
ALLIED TO *NÆVIFERELLA (STIPELLA, HÜBNER)*, WHICH
IS ATTACHED TO *SILENE NUTANS*.

BY H. T. STANTON, F.R.S.

Most of my readers who have worked at all at the larvæ of the *Micro-Lepidoptera* are familiar with the beautifully white blotch-mines in the leaves of *Atriplex* and *Chenopodium*, caused by the larvæ of *Gelechia (Nannodia) nævifera*, and those who have bred that species know well how little can an idea of the species be formed by those who know it only from specimens captured on the wing.

The insect is liable to considerable variation; and a form which seems not uncommon in Germany, to which Hübner gave the name of *stipella*, is at a first glance so strikingly different, that it is hardly a subject for wonder that for long it was considered as a distinct species from the ordinary, more sober-looking form of *nævifera*. *Stipella* differs from *nævifera* in having a broad yellow fascia a little distance from the base, and a large yellow spot on the inner margin beyond the middle, and a large yellow spot beyond it just below the pale costal spot of *nævifera*.

Of this form I do not seem to possess any British representative, but, on the other hand, I have three specimens of *nævifera*, with the entire inner margin yellow from very near the base to the anal angle—of this form I have, so far, seen no representative amongst the specimens I have at various times received from the continent.

A few years ago, my friend Herr Eppelsheim, of Grünstadt, in the Palatinate, met with a new species of *Nannodia*, to which Staudinger has given the name of *Eppelsheimi*, describing it in the Stettiner entom. Zeitung, 1885, p. 351; this insect so resembles the *stipella* form of *nævifera*, that I felt at first doubtful whether it was not really that insect, but a closer examination, and a long series with which its discoverer so liberally provided me, satisfied me that it was

quite distinct from *stipella*, and a good species. Though furnished like *stipella* with a broad yellow fascia and two large yellow spots, the form of the dorsal spot is much more contracted, and for this there is an evident reason, as its space is much more restricted, owing to its being preceded and followed by *slender silvery fasciæ* (of these silvery fasciæ we see no trace in *stipella*) ; beyond the sub-costal spot are also a few silvery scales, but I cannot see in them another fascia. Staudinger also notices as a good character the whiter tips of the hind-marginal cilia.

In striking contrast to *næviferella*, this new *Nannodia* does not seem liable to vary at all, unless it be in size. *Nannodia Eppelsheimi* feeds on *Silene nutans* (the Nottingham catchfly) in the leaves of which plant the larva mines conspicuous white blotches. The larvæ of the first brood may be found in the middle of June, those of the second brood would probably occur in September.

It is quite possible that if those who live where the *Silene nutans* occurs would search for this larva, they might have the pleasure of adding this pretty species to the British Fauna.

Mountsfield, Lewisham :
July 6th, 1886.

NOTES ON HIMALAYAN LEPIDOPTERA.

BY CAPT. A. GRAHAME-YOUNG.

Arctia cajula, Staudinger.—As I was the discoverer of this insect, a few particulars supplementing Dr. Staudinger's description (Vol. xxii, p. 258) may not be out of place.

I captured three specimens at Koksur, in Lahoul, in August, 1868, and have found it more or less plentifully on each visit that I have paid to Lahoul. In 1884, I found it in great numbers on broken ground in front of the Koksur rest-house, 10,400 feet above the sea level. I could have captured several hundreds, had I been addicted to promiscuous slaughter ; as it was, I captured some 60 or 70, which I forwarded to my correspondent, Captain Elwes, unfortunately there was only one female amongst them.

Captain Elwes is in error as to its range and habitat. It is only found in the zone between 10,000 and 12,000 feet, indeed, its metropolis seems to be a space of 2 miles, between the village of Koksur, exactly 10,000 feet, and the rest-house, 10,400. Koksur is the most easterly village in Lahoul. Outside these limits only a few stragglers are very rarely to be met with. It seems confined to the

main valley, not occurring in any of the lateral ravines ; only on one occasion did I meet with *A. cajula* as high as 12,000, when I captured a solitary specimen on a grassy plateau, called Kanor Tunka, 17 miles east of Koksur, in August, 1874. It is diurnal in its habits, flying with an undulating flight, between the hours of 7 and 11 in the forenoon, when it drops down into the herbage. The high wind that springs up daily in Lahoul, and blows from noon till sunset, is probably the cause of this.

The larva is abundant in July on dock and sorrel, it is a perfect miniature "woolly-bear," differing in no one respect, save size, from that of *A. caja*.

When full fed it forms a loose cocoon by drawing two or three leaves together, and changes into a bright chestnut pupa. The imago emerges in from 12 to 14 days. The best time for it is from the 1st to the 20th August, when it begins to disappear.

Larva of Aulocera Swaha.—I have during the present year, at last, after many years' hunting, succeeded in discovering the larva of one of the *Auloceræ*—*A. Swaha*. I found it on the wild blue Iris the first week in August, at about 8000 feet in the upper Parbutti valley, Kulu. The larva seems black, but is so very thickly clothed with short bright yellow hairs, that it is almost impossible to see what its ground colour really is ; head and legs black. It attaches itself to the centre of the leaf by the tail, and a bright yellow thread across the pupa, head upwards, like a Lycænid.

The pupa is shining olive-brown above, head, spines and tail, black, a white patch crossed by an irregular black band upon each side of the thorax, a circular yellow spot on each shoulder, on each side of the dorsal segments is an irregular white mark.

I am sending home a dead pupa for exhibition, but the colours, very vivid in the living pupa, fade rapidly upon the death of the insect.

The imago emerges in a fortnight.

For the benefit of such of your readers as may possess Marshall and De Nicéville's "Butterflies of India," I make the following additions to our Kulu lists ; at the time that Vol. 1 was published, I had not, for want of specimens, discriminated these species :—

DANAIDÆ : *Danias Aglea* (one only).

SATYRIDÆ : *Orinoma Damaris*, *Zophoessa Yama*, *Rhaphicera Satricus*, *Mycalesis Lepcha*, *Callorebia Scanda*.

Kulu, Punjab :

August 16th, 1886.

TWO NEW SPECIES OF *CORDULIINA*.

BY ROBERT McLACHLAN, F.R.S., &c.

*HEMICORDULIA FIDELIS.**♂.* Abdomen, 35 mm. Posterior-wing, 34 mm.

Wings hyaline, the posterior very slightly tinged with yellowish in the basal third: neuration black, the costal vein black externally: pterostigma black, 2 mm.; 7-8 ante-cubital and 6 post-cubital nervules in anterior-wings: membranule cinereous, slightly paler at base.

Face entirely yellow (but the base of the labrum slightly olivaceous), labium and its lobes yellow; top of front, and vesicle, shining metallic-green, slightly chalybeous, bordered with brownish; occiput black. Thorax (much crushed) apparently for the most part yellowish above, but with broad median metallic-green bands (probably densely clothed with cinereous pubescence); sides metallic-green, variegated with yellow (or *vice versa*). Abdomen nearly cylindrical, above bronzy-green (scarcely metallic), segments 8-10 black, the 10th slightly yellowish posteriorly: viewed laterally there is a large elongate brown spot on each segment, from 2 to 7, not reaching the posterior margin of the segments, and a vestige at the base of segment 8; beneath, the abdomen is almost wholly brownish-yellow, but with a broad blackish space at the posterior end of each segment. Legs black, the anterior femora wholly, and the intermediate outwardly, brownish: length of posterior tibia, 6½ mm.

Appendages wholly black. Superior appendages shorter (3 mm.) than segments 9 and 10 combined; viewed from above, they converge in a triangular manner gradually from base to apex, slightly sinuate externally in the basal half, the apical half thickened, sub-cylindrical, the apex sub-obtuse: viewed laterally, they are cylindrical, curved and rather slender at the base, followed by a *short broad triangular tooth* on the lower edge, after which they become thickened, the sub-obtuse apex slightly acuminate; they are clothed with short black hairs. Inferior appendage scarcely shorter than the superior, very elongately triangular, the apex obtuse and slightly curved upward.

♀ unknown.

Hab. : Uvea, Loyalty Islands (near New Caledonia), 1 ♂ in my collection.

This would appear to be in some respects intermediate between the groups of *H. oceanica* and *H. australis*, but more probably belongs to the latter group. The *short triangular tooth* on the lower edge of the superior appendages is a good character. The condition of the thorax in the type prevents exact description of the distribution of the pale and metallic colours.

*TETRAGONEURIA CANIS.**♂.* Abdomen, 34 mm. Posterior-wing, 32 mm.

Wings hyaline, very faintly smoky: neuration black, the costal vein yellowish externally; pterostigma black, 2½ mm.; 8 ante-cubital and 7 post-cubital nervules in anterior-wings. In the posterior-wings there is a small, furcate, basal, blackish-

fuscous spot, not extending to the first ante-cubital, and another small spot of similar colour below it, bordering the membranule, and continued outwardly on the two cross-nervules in the second series of anal cellules (in the specimen before me the triangles have a cross-nervule in both anterior-wings, and in the left posterior; it is empty in the right posterior); membranule whitish-cinereous.

Head dingy-yellow; in the excision of the top of the front is a triangular black mark, extended, as a line, along the upper margins of the eyes (antennæ black); the head is clothed with cinereous pilosity, especially dense on the vesicle, and on the occiput, where it forms a long erect fringe: back of head yellow, margined with black, and with a dense whitish-cinereous fringe. Thorax pale olivaceous, very densely clothed with cinereous pilosity; the dorsal crest, a broad humeral band, and two lines on the sides, black or blackish, the space between the two lateral lines is yellow (in which is placed the black spiracle). Abdomen moderately depressed; pale at the base, but there is a broad black dorsal band extending from the middle of the third segment to the apex, expanded at the posterior end of each segment, and leaving an elongate lateral brownish-yellow space on each segment, from 4 to 8 (the coloration of the ventral surface is nearly similar; but the pale is more prominent and the dark more subdued): on the 10th dorsal segment there is a central straight carina, on either side of which is a faint curved carina; the outer edge of this segment slightly excised. Legs black; the anterior pair yellowish up to near the end of the femur.

Appendages black. The superior appendages (3 mm.) not quite so long as the 9th and 10th segments combined: viewed above, they are straight, convergent, and sub-cylindrical, but somewhat before the apex they dilate, and become almost two-branched, the inner branch forming a short triangular tooth, the outer being much longer, curved outwardly, and stout and obtuse at the apex, its inner edge excised: viewed from the side, these appendages are very straight, gradually thickened, with a triangular production or tooth near the middle of the lower edge; *the apical portion in this position may be compared in form to a dog's (or wolf's) head, with long profile and short erect ears.* Inferior appendage extending to the portion of the superior, where these latter become suddenly altered in form (yellowish internally above), rather broad, slightly curved upward, the apex broadly excised, leaving the outer angles very prominent.

[♀ unknown to me, but I believe that both sexes exist in the collection of my friend Baron De Selys-Longchamps.]

Hab. : Western North America (Washington Territory, collected by the late *H. K. Morrison*). In my collection.

In general form, dense pubescence, &c., this quite agrees with the allied species. In the form of the spot on the top of the front it approaches *cynosura*, Say, and in the shape and extent of the dark spots at the base of the posterior-wings there is resemblance to *spinigera*, Selys. The shape of the apical portion of the superior appendages, seen laterally, is such as (in the absence of figure) to have occasioned a familiar comparison, and it also suggested the specific name.

DISCOVERY OF THE FEMALE OF *EURYBREGMA NIGROLINEATA*.

BY JOHN SCOTT.

♀. Undeveloped.

Length, 1½ line (Paris).

White, after death changing to pale yellowish, with a brown streak down each side of the centre of the pronotum, scutellum and abdomen, much broader on the latter than on either of the former; margins of the abdomen black.

Head: crown white or pale yellowish; basal foveæ deep, anterior one very minute, all three brown coloured. Face convex, brown, palest down the centre. Antennæ yellowish. Eyes dark brown. Pronotum white or pale yellowish, with a brown streak on each side of the centre, nearly in the middle of which is a small fovea. Scutellum white or pale yellowish, with a fine central keel, and a longitudinal brown streak on each side. Elytra abbreviated, transparent, reaching to a little beyond the base of the 3rd segment of the abdomen; entire marginal nerve whitish. Legs pale yellowish; apex of the third joint of tarsi and claws black. Abdomen white or pale yellowish, with a broad, longitudinal, pale brown band down each side of the centre; side-margins black, the pale intermediate space between the latter and the brown streaks with two diagonally-placed minute brown spots on each segment; viewed from behind the last segment with a black spot on each side.

Being now for a time on the Solent, and finding it impossible to get to Fawley in the New Forest, where I took the male of this fine species some years ago, as mentioned in this Magazine, vol. xii, p. 92, I lately made a few pilgrimages along the shore from where I am residing, and at last, after very hard work, had the pleasure of taking a single ♀ example not far from the mouth of the Southampton Water. Since then I have taken a male at the same place.

July 1st, 1886.

Lygaeus equestris, L., at Dover.—On the afternoon of September 7th, when out for a ramble on the cliffs in company with my friend Mr. J. J. Walker, I was fortunate enough to sweep up this beautiful bug. I at first thought I had taken *Therapha hyoscyami*; Mr. Walker, who was close to me at the time and saw it in my net, thought the same, or else that it was something better. Upon returning home we compared it with the figure of *Therapha hyoscyami* in Douglas and Scott's *Hemiptera-Heteroptera*, but found it did not agree either with the figure or with the description; nor did it with that in Mr. Saunders' Synopsis. Noticing the conspicuous round white spot on the membrane, Mr. Walker suggested it might be *Lygaeus*, and as I was writing to Mr. E. Saunders the next day, I mentioned the capture in my letter, with a slight description; in answer to which Mr. Saunders said "it sounded like *Lygaeus*." Since then I have forwarded it to him for identification, and he has very kindly returned to me as the above species.

Lygaeus equestris, L., is in the List of British *Heteroptera* in the Entomologist's Annual for 1861, p. 47, besides *L. familiaris*, Fab., and *punctum*, Fab. All three are also in the Reputed Species in Douglas and Scott's *Hemiptera*.—C. G. HALL, Dover: September 12th, 1886.

Habitat of Miridius quadrivirgatus, Costa.—Mr. Hall's query in Ent. Mo. Mag., vol. xxiii, p. 91, reminds me of my experience with the above insect. I have taken it frequently and not uncommonly at several places near Hastings, always by sweeping in grassy places, and never in connection with sallows of any kind. The spot in which it occurred most abundantly was a sloping field of no great extent, with a western aspect, about a mile from the sea, and overgrown with grasses and a considerable variety of other low herbage. The insect is certainly not confined to the coast line, for I have taken it as far inland as Robertsbridge, about twelve miles from the sea.—E. A. BUTLER, Crouch Hill, N.: *September 8th, 1886.*

Capture of Leptomorphus Walkeri, Curt., a rare fly.—Yesterday I had the pleasure of taking a specimen of *Leptomorphus Walkeri*, one of the rarest and prettiest of our British Diptera. It is admirably figured by Curtis.—C. W. DALE, Glanville's Wootton: *September 11th, 1886.*

Scybalicus longiusculus at Portland.—On July 2nd I had the pleasure of taking one of the above in the Isle of Portland; I also captured a couple of *Polystichus vittatus* at the Burning Cliff on May 24th. *Eupithecia irriguata* has been very scarce this season, but *E. subciliata* common.—ID.

Notes on Adimonia tanaceti, L.—This beetle is common in a little moist meadow adjoining Maltby Wood, near Louth, Lincolnshire, where its larvæ (black above and dark olive-green beneath) may be found plentifully feeding on the leaves of *Scabiosa succisa*. One occasion I also saw them eating *Centaurea nigra*. On July 6th this year I took home some nearly full-fed larvæ; one of them which I separated from the rest pupated on July 11th, and remained in that state eleven days. The larva, when about to pupate, retired to a chink in the earth at the bottom of the vessel in which it was kept, and surrounded itself with a slight cocoon of brown silk, to which small pieces of earth were attached. The pupa is yellow, with a few short black hairs above; the antennæ and wings lie immediately behind the first and second pair of legs, and their ends overwrap the third pair of legs. Two days before the imago emerged, the head, thorax and legs of the pupa darkened into grey.—H. WALLIS KEW, Louth, Lincolnshire: *September 2nd, 1866.*

Tenacity of life in Lucanus cervus.—A large ♂, caught on August 7th at Battersea Park was given to me, and was still living after ten minutes' exposure to the densest fumes of sulphur I could create. I never knew of an insect existing so long in such an atmosphere. Another curious fact respecting it is, that after remaining on the setting board nearly a fortnight, it almost fell to pieces on removal; this circumstance I can only attribute to some peculiar action of the sulphur fumes upon the beetle, and would recommend Entomologists to kill *L. cervus* for the future in boiling water. This insect is, I hear, common this year; I have received two from Battersea Park this month.—E. BRUNETTI, 129, Grosvenor Park, Camberwell, S.E.: *August 10th, 1886.*

Odour from Creophilus maxillosus.—On catching in the house a specimen of this beetle last June, it exuded a thick white liquid which gave out an odour exactly resembling that of bananas. I do not know if this has been noted before.—ID.

Sirex gigas ovipositing.—In the spring of this year a child denuded a branch of Deodara, of about six inches in diameter, of its bark on one side for a space of about three feet; the wood appears perfectly sound and is extremely hard. On the 30th June one of my children came to me and said, "Do come, I have got something really good on the fir tree." On proceeding to the spot I found a fine female of *Sirex gigas* sitting on the bare spot of the Deodara branch; expecting it would fly away, I put my hand out at once and took it by the wings, but found it adhered to the wood; at first I supposed the tarsi were the source of the adhesion, but I found this was not the case, but that the borer of the ovipositor was engaged in the solid wood, and I believe an egg was laid, though I fear I thoughtlessly destroyed it in probing the hole with a pin to ascertain its depth; this proved to be very slight, not more than a line. It seems extraordinary that such a solid piece of wood should be selected to receive the egg; but the vitality of the branch is doubtless somewhat diminished in consequence of its denudation, so that the observation would seem on the whole to support the views of those who doubt whether xylophagous insects ever attack perfectly healthy and vigorous wood.—D. SHARP, Southampton: *July 1st, 1886.*

Anisolabis maritima, Bonelli.—Numerous specimens of this earwig were captured by Mr. T. J. Bold in September, 1856, at South Shields, under stones on the sand (*vide Trans. Tyneside Naturalists' Field Club*, vol. iv, 1858—60, pp. 55—6). It was then supposed to have been recently imported by shipping; but no evidence of its having established itself in the country seems to have been given since. Would not some Entomologist of the district make search for this interesting species, and allow us to add it to our very meagre Orthopterous fauna?—ELAND SHAW, 13, Lanhill Road, London, W.: *September, 1886.*

British Orthoptera.—If any Entomologist will give me well authenticated information of the recent occurrence in Britain of the following Orthoptera, I shall be greatly obliged:—*Anisolabis maritima*, Bon., *Œdipoda cœrulescens*, Linné, *Psophus stridulus*, Linné, *Decticus verrucivorus*, Linné, *Œcanthus pellucens*, Scop., *Nemobius (Acheta) sylvestris*, Fab.—ID.

Deilephila euphorbiae reported from Bowdon.—I have had a specimen of *Deilephila euphorbiae* brought to me, which was caught at Bowdon this season; evidently the larva had fed near where it was found, at rest on the trunk of a tree. Both wings are crippled on the right side, it is otherwise perfect and in beautiful condition.—JOSEPH CHAPPELL, 29, Welbeck Street, Manchester: *September 1st, 1886.*

Habits of Phycis carbonariella (Salebria fusca).—One of the most singular preferences known among small moths is that of *Phycis carbonariella* for burnt

places on heaths. A fire, lighted by accident, or for mischief, or sometimes to allow of the growth of young herbage, sweeps across a heath destroying everything (plants and insects) for hundreds of yards, and leaves a dreary waste of burnt débris and charred sticks, and when the next autumn arrives, *Phycis carbonariella* deserts the living heather on which it surely must have fed and resorts in numbers to this burnt ground. I have certainly seen a hundred specimens on such a piece of ground in less than an hour, when the whole number disturbed from among living heather in an afternoon would not exceed four or five, and this on occasions when they flew quite freely, towering in the wildest manner. The resemblance of the moth to the charred sticks is wonderfully close, and its sagacity in choosing such a resting place would be equally surprising if it could only be satisfied to sit still, and not hurry away at the smallest alarm.

The only satisfactory explanation appears to be that the creature has an acute sense of the fitness of things, and feeling that its black coat harmonizes but ill with anything that is living or growing, it congregates where the fire has reduced everything to the same carboniferous condition. This seems to be an unexpected application (by the moth) of the theory of natural selection, but as the *normal* condition of heaths can hardly be that of periodic burning, or can hardly have been so long enough to produce so important a modification in a moth, and as there are very few birds on these heaths, and none equal to inflicting serious damage on so active an insect, I can only suppose that a theory of individual *preference* is applicable in this case.—CHAS. G. BARRETT, King's Lynn, Norfolk: *September, 1886.*

Food of Acidalia luteata.—In a pretty but very swampy dingle between two of the hills of Cannock Chase I found *Acidalia luteata* quite commonly. The dingle is of considerable length, but they are crowded together at its upper end among the last few alder trees, in which they rested, and about which they flew freely in the afternoon and evening. Possibly this crowding may have been caused by the wind, which blew strongly up the dingle day after day. The place was difficult to examine from its extreme wetness, but I think that I am safe in asserting that no maple whatever grew in the vicinity, and that alder must without doubt have been the food plant of the larvæ. Mr. Hill tells me that the moth is common in similar situations in Derbyshire, and Mrs. Fraser found it some years ago under the same conditions in one of the valleys in the Highlands of Perthshire. This habit of this very pretty species is probably well known in the north, but I do not remember to have seen it recorded. In the south and east its food plant is certainly the maple (*Acer campestre*).—ID.

Probable food of Gelechia longicornis.—I saw this pretty insect alive for the first time in the beginning of June on Cannock Chase; it was then just beginning to emerge, and was to be found almost exclusively among *Empetrum nigrum*, from the tufts of which plant I secured many perfect and lovely specimens. Later in the month it was to be found occasionally in various parts of the heath where apparently there was no *Empetrum*, but these specimens were usually more or less worn, while, during the whole month, the tufts of that plant would furnish fresh and perfect

specimens, many of them females. My stay in the district was too short to allow of any search for the larva, but I have little doubt that it will be found to feed on the *Empetrum*.

The beauty of the moth when alive is very striking, especially in the red and ashy-white varieties, and there is something extremely curious in their resemblance in form, attitude, and general appearance to the pretty *Pempelia (subornatella, dilutella, and porphyrella)*, species which cannot be expected to occur in the same district or at the same season, and to which this species is not in the smallest degree allied.—ID.

Singular habit of Hepialus hectus.—I have again noticed the very distinct and even powerful perfume of pine-apple given off by the male *Hepialus hectus*, and now think that it is connected with rather abnormal sexual habits in this species.

One evening in June they commenced flying very early (about half-past eight o'clock) in broad daylight, and on capturing some males which were quite freshly out I noticed the perfume very distinctly. Presently, while watching two males oscillating in their peculiar manner in a little space enclosed by two or three bracken fronds, I saw a female flying along, when she entered the space, she *flew against* one of the males, buzzed about a little, and then settled on one of the bracken fronds, where she hung with quivering wings. Instantly the male began to search for her, not apparently assisted at all by vision, but buzzing blindly up and down and around the spot until he came in contact with her quivering wings.

This proceeding was so surprising that I watched further, and presently another female went through a similar performance, and then a third, the males in each case being within a very small space, regularly oscillating until discovered and interrupted. Yet the males were not plentiful at all, and bracken was of course very abundant, and the female coming from a distance, had apparently no reason for flying into the little space occupied by the males, unless, as seemed evident, drawn into that direction by the scent. I certainly did not see any female *fly past* one of these oscillating specimens.

A somewhat similar habit has been recorded in the case of *Hepialus humuli*, where also the female flew actually *against* the oscillating male; and I feel no doubt that this curious reversal of the usual order of things takes place in each species in which the males, instead of flying in search of their partners, oscillate over a limited space.—ID.

Leucania vitellina, &c., at Finchley.—I have occasionally collected in my garden here during the past summer. By netting I captured three *A. ophiogramma*, and at sugar, amongst numerous species, several *T. subtusa*. About a fortnight ago I was so fortunate as to secure at sugar a fine ♂ *L. vitellina*, and since have taken two *X. gilvago*. The occurrence of *L. vitellina* so far inland surprised me, as, so far as I remember, it has hitherto in this country been observed only on the coast.—W. T. STURT, Cyprus Road, Finchley: *September, 1886.*

I gathered a quantity of *Impatiens noli-me-tangere*, and upon opening the bag yesterday I found a full-fed larva of this rare species; also a couple of *Plusia* larvae (small), which I think must be *P. bractea*. I shall no doubt find more larvae when I carefully search the plant.—E. G. MEEK, 56, Brompton Road, London, S.W.: September 3rd, 1886.

Occurrence in West Sussex of Cosmopteryx Schmidella, Frey, a species new to Britain.—So far as I know, none of the beautiful moths of the genus *Cosmopteryx* have as yet been recorded from Mr. H. C. Watson's vice-county of West Sussex, although the food-plants of all the known British species occur therein abundantly. It is with the greater pleasure, therefore, that I am able to announce the finding of *C. Schmidella* in the larval state in some numbers last week a few miles from Worthing. The insect seems to frequent plants of *Vicia sepium* growing in low damp hedgerows. When the larvae are scarce they feed chiefly in the lower leaves of the plant; when they are numerous they attack also the upper ones. It appears that even when the insect occurs somewhat freely, it is very local in its distribution, and that one may search a quantity of the vetch before meeting with any success.

A full life-history of the species has been published by Mr. Stainton (Nat. Hist. Tin., xii, 30), and he has also kindly told me that there is no doubt as to the identity of my larvae.—W. H. B. FLETCHER, Fairlawn, Worthing: Sept. 15th, 1886.

On the specific distinctness of Tephrosia crepuscularia, W. V., and biundularia, Esp.—With every respect for the great discrimination and good judgment of Mr. Barrett, I must demur to the conclusions at which he arrives respecting these two insects. He appears to me to rely too much on the difficulty of naming an extreme form of either species, and to take too little notice of the marked *natural* differences between them. To put the case briefly, *crepuscularia* emerges in March or April, *biundularia* in May or June. They are very similar in colour and markings, but *crepuscularia* is browner than its near relative, and can be distinguished by that character, which is tolerably constant. The offspring of both insects in favourable seasons or localities feed up and emerge the same year, or part of the brood does. This second brood, in both species, presents the same characteristics as the first, slightly modified only as is usual in second appearances. Both vary more or less in intensity of colour, pale *crepuscularia* approaching normal *biundularia*, dark *biundularia* approaching normal *crepuscularia*. Extreme forms of both occur that may be said to overlap the other, rendering the identification of a single abnormal specimen rather difficult. But selected specimens, or the series found in the best cabinets are no true basis for argument, and conclusions founded on such an illustration are likely to be erroneous. To arrive at a correct conclusion, series should be examined as they occur in nature; those occurring at one time and place being put together and compared with others taken at another time or place, or both. Mr. Barrett lays stress on the fact that he could not name some specimens sent him by Professor Zeller, but these specimens were selected as a puzzle, and it is clear from the quotation given that Zeller himself could separate the two forms,

though he did not believe them distinct. Had he sent a fair series as they were taken, including these puzzling specimens among their congeners, I am tolerably certain Mr. Barrett would have had no difficulty in the matter.

Can any one name with certainty an odd specimen of *A. psi* and *tridens*, of *C. alsines* or *blanda*, without comparison of others? Yet with a fair series to examine and compare, there is no great difficulty with either. No one supposes that because of the difficulty of naming an isolated example of one of these insects that the species are identical, though they may occur at the same time and place. How much less reason then for fusing *crepuscularia* and *biundularia*, when they actually occur at different periods of the year, and are known not to be two broods of the same insect. The difficulty with the larvæ is not greater than obtains with some of the *Zygæna*, and the perfect insects of these are so puzzling that probably no two Lepidopterists agree precisely as to the number of species they recognise. Here (county Durham), which I suppose Mr. Barrett would call a northern locality, we get *biundularia* in May and June. They are always of the normal form, typical *biundularia*. I have more than once reared it from the egg, and never got any departure from the type. Yet this is a district where dark varieties of many species occur not uncommonly. Mr. Barrett concludes that it is "unreasonable to attempt to keep up the purely artificial distinction between these two forms." To me it seems much more unreasonable to attempt to ignore the truly natural distinction between them, merely because in odd specimens we are unable to find an artificial—perhaps I had better say superficial—distinction.—JOHN E. ROBSON, Hartlepool: *September 8th, 1886.*

Description of the larva of Pterophorus tetracactylus.—Early in the season of last year, Mr. Eustace R. Bankes, of Corfe Castle, found a larva on wild thyme, from which he bred a specimen of *Pterophorus tetracactylus*; so, knowing my want of the species, he this year very kindly made a special search for it, the result being, that on May 20th, I had the pleasure of receiving three specimens from him, together with several healthy growing plants of the thyme on which to feed them.

Length, when full grown, about half an inch, and of ordinary *Pterophorus* shape, *i. e.*, plump, stoutest in the middle, attenuated at the extremities, rounded above, flatter beneath; head small and glossy, considerably narrower than the second segment; a tuft of short hairs springs from each tubercle. Ground-colour bright pea-green, when younger (*i. e.*, previous to the last moult) having a yellowish tinge; head yellowish-green, the mandibles and a spot on each side of them brown; the broad dorsal stripe is of a considerably darker shade of green than the ground-colour, and is powdered on each side with greyish-white; sub-dorsal stripes of the same dark green colour, but not so conspicuous; spiracular stripes rather broad, yellowish-grey; segmental divisions and hairs white. When younger the segmental divisions are yellowish-grey, and the hairs grey. Ventral surface, legs and prolegs uniformly of the bright pea-green of the dorsal area.

I bred no imagos, as the larvæ came to grief during my absence in London; but in this case it did not much matter, for Mr. Bankes having fortunately reared the imago from a similar larva the previous year, had thus made sure of the species. Apart from that they were too large for *P. parvidactylus*, the other thyme feeding species, which, moreover, Mr. Bankes believes does not occur in the district.—GEO. T. PERRITT, Huddersfield: *September 3rd, 1886.*

Obituary.

Maurice Girard.—According to "Le Naturaliste," this well-known French Entomologist died suddenly, very recently, at Lion-sur-Mer (whither he had gone to spend the vacation), aged 64. He held an official position on the Commission for public instruction in Natural History. In 1867 he was President of the French Entomological Society. France has produced many entomologists who have done more and much better original work than did Girard, but she has lost in him a most industrious writer on all subjects connected with applied entomology, and a careful compiler of entomological educational works. In 1876 he presented to the French Academy an important Memoir on the Diseases of the Vine in Charente, in which the *Phylloxera* is treated upon in a considerably exhaustive manner. He was a frequent communicator of notes at the meetings of the French Entomological and other kindred Societies. A very useful little manual from his pen, intituled, "Les Métamorphoses des Insectes," passed through numerous editions. Another similar work by him treats on "Les Abeilles." His "Histoire Naturelle : Zoologie" is an educational manual somewhat on the plan of Milne-Edwards' "Cours Élémentaire," but more extended. But what is probably his principal work is the "Traité élémentaire d'Entomologie," of which three thick volumes have appeared ; a laborious and careful compilation brought down to date, and embodying an enormous mass of information, with numerous plates, which are, for the most part, adapted from Guérin's "Iconographie." In manner Girard was courteous and affable ; always seeking information, he was always ready to impart it.

Baron Edgar von Harold.—Recent German publications record the death, on the 1st of August, of this eminent Coleopterist, the fellow worker of Dr. Gemminger in the compilation of the well-known Munich Catalogue of *Coleoptera*, entitled "Catalogus Coleopterorum hucusque descriptorum synonymicus et systematicus." Von Harold was an officer of the Royal Guard of Bavaria, and saw active service in the war of 1866 ; a severe wound in the engagement at Kissingen during that campaign appears, however, to have closed his military career. We gather from certain allusions in his earlier articles on his special group, the *Copridæ*, that he commenced the study of the *Aphodiinae* long before 1857, in which year he began gathering the material for the great Catalogue. His first essay, published in the "Berliner entomologische Zeitschrift," 1859, indeed, gave evidence of considerable previous study, and showed that the entomological ranks had been recruited by a writer of great acumen and power of original observation. To this paper, entitled, "Contributions to the knowledge of Coprophagous Lamellicorns," others of similar vigorous analytical style on the same subject appeared in rapid succession until about four years ago, when, to the regret of his numerous admirers and correspondents in Europe and America, his activity suddenly ceased.

The first volume of the Munich Catalogue was published in 1868 ; the 12th and last in 1876. In 1867 he started a serial work of his own, specially devoted to *Coleoptera*, under the title of "Coleopterologische Hefte;" in this appeared many of the important monographs of genera of *Copridæ*, and elucidations of questions relating to classification and nomenclature, for which he will long be gratefully remembered by students of this large and difficult group of *Coleoptera*. The "Hefte" were digitized by Google

continued to appear at irregular intervals until 1879, when the 16th and last was published. In 1879 he undertook also the Editorship of the "Mittheilungen des münchener entomologischen Verein," and contributed many valuable papers to its pages; the 5th and last annual volume of this serial appeared in 1881. Numerous monographic and faunistic papers from his active pen were published during the years 1860 to 1881 in other scientific periodicals, chiefly the Annals of the French Entomological Society, and the "Stettiner entomologische Zeitung." Some time previous to the cessation of his active career as an Entomologist he accepted a post at the Berlin Museum, under the late Dr. Peters; he published but little during this period.

THE SOUTH LONDON ENTOMOLOGICAL AND NATURAL HISTORY SOCIETY,
August 19th, 1886: The Vice-President in the Chair.

Dr. H. C. Lang, F.L.S., and Mr. J. M. Adye were elected Members.

Mr. Sheldon exhibited bred series of *Conchyliis dilucidana*, St., *Grapholitha geminana*, St., *Ephippiphora cirsiana*, Zell., *E. fanella*, L., and some interesting forms of *Xanthosetia zægana*, L., from Hackney Marshes. Mr. Wellman, *Acidalia emarginata*, L., bred from ova. Mr. J. J. Weir, xanthic varieties of *Erebia Epiphron*, Knoch., *Epinephele Janira*, L., *Satyrus Semele*, L., *Castronympha Pamphilus*, L., a very pale *Polyommatus Phœas*, L., and a light specimen of *Eubolia bipunctaria*, Schiff. Mr. J. A. Cooper, a long series of *Argyrolepis badiana*, Hb., and he stated that both Mr. Stainton and Mr. Merrin gave the food plant as the roots and stems of burdock (*Arctium lappa*), but he had searched carefully, and had been unable to find any larvæ in the roots and stems, although they were plentiful in the seed-heads of the plant, from which those now exhibited were bred; he also exhibited varieties of *Spilosoma menthastris*, Esp., and *Phorodesma smaragdaria*, Fb., from larvæ found in the Essex Salt Marshes. Mr. Jobson also exhibited *P. smaragdaria* and *Erastria venustula*, Hb., the latter bred from ova. Mr. J. T. Williams, an almost albino variety of *Acidalia bisetata*, Hufn., and a variety of *Larentia olivata*, Börh., having the whole of the base of the wings suffused as far as the band. Mr. C. Oldham, varieties of *Calymnia trapezina*, L. Mr. Mera, pale and dark varieties of *Abrazas grossulariata*, L. Mr. Frohawk, *Timandra amataria*, L., bred from ova laid on July 7th last, and coloured drawings of the larva and pupa. Mr. Goldthwaite, black forms of *Eupithecia rectangulata*, L.

September 2nd, 1886: The President in the Chair.

Mr. J. H. Carpenter exhibited dark forms of *Smerinthus populi*, L. Mr. Wellman, a box of Exotic *Lepidoptera*, all taken at sea, and one, a species of *Sphinx*, having been captured one thousand miles from land; also a large number of varieties of *Bryophila perta*, Fb., and living larvæ of *Cidaria picata*, Hb., and *Acidalia rusticata*, Fb. Mr. Sheldon, grey and red forms of *Noctua castanea*, Esp., bred from larvæ taken on Shirley Heath, Surrey. Mr. South, nine varieties of *Lycana Corydon*, Fb., from Eastbourne, and he said that he had also taken a number of specimens which formed the connecting links between those now exhibited; one group had but few spots on the under-side, in another the spots were absent, and in the remaining group the spots were confluent: he also exhibited varieties of

Abraxas grossulariata, L., and specimens of *Dicrorampha consortana*, S., var. *distinctana*, Hein. With reference to this last mentioned insect, Mr. South said that he first took a couple of specimens in 1881 in North Devon, one of which was sent to Mr. C. G. Barrett, who identified it as *Dicrorampha distinctana* of Heinemann. This year he has bred 14 specimens from a batch of *Chrysanthemum* received from North Devon, and the larva was identical with the description of a larva of *consortana* taken by him at Shanklin, Isle of Wight. Mr. J. J. Weir, exhibited seven specimens of *Argynnis Paphia*, L., and one of *Argynnis Euphrosyne*, L., and drew attention to a number of white spots on the wings, which he stated were not suffused spots as in *Janira*, but were always well defined, and in nearly all cases symmetrical. A discussion then took place as to the origin of these spots, in which Messrs. South, Carrington, Adkin, Sheldon, and others took part. Mr. Adkin, exhibited light and dark forms of *Cleoceris viminalis*, Fb. Mr. Cooper, *Zonosoma orbicularia*, Hb., *Eupithecia subfulvata*, Haw., and *Tephrosia biundularia*, Bork., bred from a female captured last June, the larva having fed up on knotgrass. Mr. T. R. Billups, a rare species of *Hymenoptera*—*Tachytes unicolor*, Panz., taken at Hayling Island June 7th; the following species of *Coleoptera*; the very scarce *Choragus Sheppardi*, Kirb., from Broadstairs; *Molorchus minimus*, Scop., and *Myctoporus longulus*, Mann., from Bookham; and the scarce *Panagaeus quadripustulatus*, Sturm.; also two local species of *Hemiptera*, *Phylus coryli*, Linn., and *P. avellane* from Westerham, and *Ledra aurita*, Linn., from Broadstairs.—H. W. BARKER and W. A. PEARCE, *Hon. Secs.*

ENTOMOLOGICAL SOCIETY OF LONDON: September 1st, 1886.—ROBERT McLACHLAN, Esq., F.R.S., President, in the Chair.

The following were elected Fellows:—The Rev. Professor Dickson, D.D., of Glasgow University; Mr. P. Cowell, of Liverpool (formerly subscribers); Mr. A. O. Walker, of Colwyn Bay, North Wales; and Mr. Lyddon Surrage, of Hertford College, Oxford.

The President remarked with regard to the gnats from the Kent Waterworks, exhibited at the last meeting, that Professor Westwood had since informed Mr. Douglas that they were only the ordinary *Culex pipiens*.

Mr. Slater exhibited certain parasites found on a larva of *Smerinthus tiliæ*, which Mr. Waterhouse believed to be *Uropoda vegetans*, a species of *Acari*.

Mr. W. Warren exhibited the following *Lepidoptera*, viz.:—*Eupithecia fraxinata*, caught in Regent's Park; *E. innotata* (Hüb.), bred from *Artemisia maritima*; a variety of *Eupithecia satyrata*; a *Gelechia*, caught in Wicken Fen twenty years ago by Mr. Bond, and believed to be a new species; *G. fumatella* (Dgl.) or *celerella* (Stn.) from Hayling Island; *G. virella* (Zell.), bred from larvae collected on the Essex coast on mallow; *Lithocletis scabiosella* (Dgl.), bred from larvae found near Croydon; and *Catoptria parvulana* (Wlk.), bred by Mr. Vine, of Brighton, from *Serratula tinctoria*. He also exhibited larvae of *Gelechia virella*.

Mr. South exhibited specimens of *Dichrorampha distinctana* (Hein.), and stated that he considered it to be merely a variety or local form of *D. consortana*, from which, in the larval stage, it could not be separated.

Mr. Stevens exhibited a living specimen of *Clerus formicarius*, found under the bark of an ash tree in Arundel Park, Sussex.

Mr. Billups exhibited *Chrysis succincta* (Linn.), taken by sweeping at Chobham on the 28th July last. He stated that this very rare species was recorded by Shuckard as having been taken in a sandy lane near Brockenhurst, in the New Forest, and at Blackwater, on the borders of Berks and Hants; and he further stated that the late Mr. Frederick Smith had taken specimens in Hampshire. He also exhibited *Microphysa elegantula* (Bär.), taken at Broadstairs, Kent, on the 23rd August last.

The Rev. W. W. Fowler exhibited, on behalf of Mr. Theodore Wood, a larva of *Langelandia anophthalma* (Aubé), a species new to Britain.

Mr. H. Goss exhibited specimens of *Orygastra Curtisi* (Dale), recently taken near Christchurch, Hants. He stated that he had met with the species in the same locality in 1878, but had never seen it anywhere else in the United Kingdom, nor was he aware of any recent record of its capture. Mr. McLachlan observed that the species was taken many years ago in Dorsetshire by the late Mr. Dale and others, but that he knew of no recent captures except those recorded by Mr. Goss. He made some remarks as to the distribution of the species on the continent of Europe.

Mr. McLachlan exhibited a specimen of *Dilar meridionalis* (Hagen), taken by him in July last in the Pyrénées Orientales; also about 150 examples of the genus *Chrysopa* from the same district, where these insects abounded. Amongst them were *C. vulgaris* (Schneider), *perla* (L.), *Walkeri* (Brauer), *viridana* (Schneider), *tenella* (Schneider), *prasina* (Burm.) and varieties, *flava* (Scop.), *septempunctata*, (Wesm.), *flavifrons* (Brauer), and others not yet fully identified. He obtained about 1500 specimens of *Neuroptera* in all families during his recent visit to the Pyrenees, which were being prepared for study. He also exhibited a few *Coleoptera* from the same district, and remarked on the extraordinary abundance of the pretty Lamellicorn, *Hoplia cærulea*, which was so common as to give the meadows the appearance of being studded with multitudes of brilliant blue flowers.

Mr. C. O. Waterhouse called attention to the numerous reports, which had lately appeared in the newspapers, of the supposed occurrence of the Hessian Fly (*Cecidomyia destructor*) in Britain, and inquired whether any communication on the subject had reached the Society. The Rev. W. W. Fowler stated, in reply, that he had been in communication with Miss Ormerod on the subject, and that she had informed him that neither the imago nor larva of the species had been seen, and that the identity of the species rested on the supposed discovery of the pupa.

Mr. A. H. Swinton communicated a paper, entitled "The dances of the Golden Swift."—H. Goss, *Secretary*.

LIST OF BRITISH *TIPULIDÆ*, &c. ("DADDY-LONGLEGS"), WITH NOTES.

BY G. H. VERRALL, F.E.S.

The old family *Tipulidæ* is now commonly divided into four, as in the list below. We have had no list of the British species since Osten-Sacken's systematic arrangement of the genera in his admirable Monograph of the North American forms. I believe I have more or less satisfactorily disposed of all Walker's doubtful species, which will be of very great use to future workers in this group; but they require still closer study. The number of species new to Britain is surprising, for, in addition to twenty-eight which I introduced last January, I now bring forward about fifteen more, and have still nearly twenty-five others, which I have either failed to recognise, or of which I possess insufficient materials for identification.

I do not profess to have given a complete list of the reputed British species.

I intend following up the list with tables and notes.

DIXIDÆ.	nubeculosa, Mg.	sericata, Mg.
DIXA, Mg.	flavipes, F.	grisea, Mcq.?
aprilina, Mg.	nebulosa, Ztt.	glabrata, Wlk. (<i>nec</i> Mg.).
<i>cincta</i> , Curt.	analis, Mg.	stigmatica, Mg.
<i>fuliginosa</i> , Curt.	nitida, <i>n. sp.</i>	<i>affinis</i> , Schum.
festivalis, Mg.	analis, Wlk. (<i>nec</i> Mg.).	morio, F.
maculata, Mg.	nigropunctata, Schum.	<i>leucocephala</i> , Schum.
<i>maesta</i> , Curt.	tripunctata, F.	<i>angustipennis</i> , Ztt.
<i>puberula</i> , Lw.	trivittata, Schum.	dumetorum, Mg.
nebulosa, Mg.	? <i>punctigera</i> , Wlk.	<i>transversalis</i> , Wlk.
<i>nubilipennis</i> , Curt.	macrostigma, Schum.	didyma, Mg.
PTYCHOPTERIDÆ.	? <i>inusta</i> , Mg.	<i>oscillans</i> , Hal.
PTYCHOPTERA, Mg.	DICRANOMYIA, Steph., O.-S.	ornata, Mg.
contaminata, L.	aquosa, <i>n. sp.</i>	RHIPIDIA, Mg.
lacustris, Mg.	pilipennis, Egger.	maculata, Mg.
paludosa, Mg.	<i>turpis</i> , Wlk.	ctenophora, Lw.
<i>fasciata</i> , Wlk.	? <i>pubipennis</i> , O.-S.	GERANOMYIA, Hal.
scutellaris, Mg.	modesta, Mg.	unicolor, Hal.
albimana, F.	<i>autumnalis</i> , Stæg.	<i>maculipennis</i> , Curt.
LIMNOBIADÆ.	? <i>albifrons</i> , Wlk.	RHAMPHIDIINÆ.
LIMNOBIINÆ.	mitis, Mg.?	RHAMPHIDIA, Mg.
LIMNOBIA, Mg.	? <i>inusta</i> , Wlk.	longirostris, Mg.
bifasciata, Schrk.	<i>disjuncta</i> , Wlk.	var. ? <i>flava</i> , Wlk.
<i>xanthoptera</i> , Mg.	<i>stigma</i> , Wlk.	OREMARGA, O.-S.
annulus, Mg.	<i>sera</i> , Wlk.	virgo, Ztt.
quadrinotata, Mg.	<i>globata</i> , Wlk.	ANTOCHA, O.-S.
<i>maculata</i> , Wlk.	<i>lutea</i> , Mg.	<i>opalizans</i> , O.-S.
	<i>chorea</i> , Mg.	<i>saxicola</i> , O.-S.

THAUMASTOPTERA, Mik.
calceata, Mik.

ERIOPTERINÆ.

EMPEDA, O.-S.

flava, Schum.
imbuta, Wlk.
nubila, Schum.
tenella, Wlk.

GOONIOMYIA, Steph., O.-S.

tenella, Mg.
lateralis, Mcq.
manifesta, Wlk.
flavolimbata, Hal.
sexguttata, Dale.
sexmaculata, Hal.
pulchripennis, Lw.

ACYPHONA, O.-S.

imbuta, Mg.
maculata, Mg.

MOLOPHILUS, Curt., O.-S.

ochraceus, Mg.
crassipes, Curt.
appendiculatus, Stæg.
propinquus, Egg.
bifilatus, Ver.
obscurus, Mg.
murinus, Mg.
pygmæus, Mcq.
ater, Mg.
brevipennis, Curt.

RHYPHOLOPHUS, Kolen., O.-S.

lineatus, Mg.
apparens, Wlk.
nodulosus, Mcq.
hederæ, Curt.
diturnus, Wlk. (pt.).
similis, Stæg.
varius, Mg.
hæmorrhoidalis, Ztt.

ERIOPTERA, Mg.

macrophthalma, Lw.
flavescens, L. (et Auct.).
lutea, Ztt. (ol.).
divisa, Wlk.
lutea, Mg.
tænionota, Mg.
analis, Ztt.

fuscipennis, Mg.
trivialis, Mg.
cinerascens, Mg.
ciliaris, Schum.
sericea, Mcq.
diurna, Wlk. (pt.).
grisea, Wlk.

SYMPLECTA, Mg.

punctipennis, Mg.
cana, Wlk.
stictica, Mg.

TRIMICRA, O.-S.

pilipes, F.

LIPSOBOTHRIX, Lw.

errans, Wlk.
remota, Wlk.
ignota, Wlk.
icterica, Egg.

LIMNOPHILINÆ.

IDIOPTERA, Mcq.

fasciata, L.
pulchella, Mg.
maculata, Mcq.
fasciata, Schum.
trimaculata, Ztt.

EPHELIA, Schin.

miliaria, Egg.
? mundata, Lw.
apicata, Lw.
submarmorata, n. sp.
marmorata, Mg.
decora, Hal.

DACTYLOLABIS, O.-S.

Frauenfeldi, Egg.

PÆCILOSTOLA, Schin.

punctata, Schrk.
ocellaris, Mg.
pictipennis, Mg.

EPIPHRAMA, O.-S.

piota, F.
ocellaris, Curt.

LIMNOPHILA, Mcq.

Meigenii, Ver.
nigrina, Mg. (nec W.).
dispar, Mg.
punctum, Wlk.

lineola, Mg.
ferruginea, Wlk.
lineolella, n. sp.
lineola, Wlk.
? fulvonervosa, Schum.

aperta, n. sp.
ferruginea, Mg.
præsta, Schum.
flavescens, Mg.
unicolor, Wlk. (desc. nec Fig.).

ochracea, Mg.
lucorum, Wlk.
tempestiva, Wlk.
aberrans, Wlk.

bicolor, Mg.
tarda, Wlk.

punctum, Mg.
glabricula, Mg.
longicornis, Schum.
binotata, Ztt.

fuscipennis, Mg. (nec Schin.).

discicollis, Mg.
lucorum, Mg.
sepium, Ver.
lucorum, var. β , Zett.

nemoralis, Mg.
obsoleta, Wlk.
adjuncta, Wlk.
inclusa, Wlk.
leucophæa, Ztt., Wlk. ?

filata, Wlk.

senilis, Hal.

TRICHOCERA, Mg.

annulata, Mg.
fuscata, Wlk.

hiemalis, Dg.
saltator, Harr.

fuscata, Mg.

regelationis, L.

ANISOMERINÆ.

ANISOMERA, Mg.

æqualis, Lw.
nigra, Wlk.

Burmeisteri, Lw.
nigra, Burm.
vittata, Wlk.

PERONECERA, Curt.

fuscipennis, Curt.

lucidipennis, Curt.

AMALOPINÆ.

ULA, Hal.

pilosa, Schum.
mollissima, Hal.
vagans, Wlk.
inconclusa, Wlk.
macroptera, Mcq.

DICRANOTA, Ztt.

pavida, Hal.
bimaculata, Schum.
demissa, Hal.
finitima, Wlk.
secreta, Wlk.

AMALOPIS, Hal.

unicolor, Schum. (? Wlk., Fig.,
nec desc.)

immaculata, Mg.
occulta, Mg.
straminea, Mg.
littoralis, Mg.
tipulina, Egg.

PEDICIA, Ltr.

rivosa, L.
venosa, Wlk.

CYLINDROTOMINÆ.

CYLINDROTOMA, Mcq.

distinctissima, Mg.
diversa, Wlk.

LIOGMA, O.-S.

glabrata, Mg.

TIPULIDÆ.

DOLICHOPEZA, Curt.

sylvicola, Curt.
chirothecata, Wlk.
opaca, Mik.

NEPHROTOMA, Mg.

dorsalis, F.

PACHYERHINA, Mcq.

crocata, L.
perpulcher, Harr.
flavofasciata, Dg.
imperialis, Mg.
scalaris, Mg.

scurra, Mg.
histrion, F.
flavescens, L. ?
lineata, Scop.
flavomaculata, Dg.
cornicina, Mg. (ol.).
maculosa, Ztt. (ol.).
maculosa, Mg.
flavescens, Wlk. (pt.).
maculata, Mg. (ol.).
cornicina, L.
sannio, Mg.
iridicolor, Schum.
guestfalica, Westh.
analis, Schum.
quadrifaria, Mg.
fascipennis, Ztt.
var. dentata, Ztt.
annulicornis, Mg.
variicornis, Schum.

TIPULA, L.

nigra, L.
pagana, Mg.
dispar, Hal.
luridiventris, Ztt.
obsoleta, Mg.
marmorata, Stæg.
confusa, V. d. Wulp.
marmorata, V. d. Wulp. (ol.)
marmorata, Mg.
obsoleta, Ztt.
rufina, Mg.
longicornis, Schum.
truncorum, Mg.
hortensis, Mg.
hortorum, Mg. (ol.).
pabulina, Mg.
rufipennis, Mg.
stigmosa, Mcq.
hortulana, Mg.
submarmorata, Schum.
luridirostris, Schum.
varipennis, Mg.
simplicicornis, Ztt.
nigricornis, Mcq.
nubeculosa, Mg.
hortorum, F., L. ?
guttulifera, Ztt.
montana, Curt.
scripta, Mg.
excisa, Wlk.

melanoceras, Schum.
lineata, Stæg.
plumbea, F.
pruinosa, W.
luteipennis, Mg.
flavolineata, Mg.
antennata, Schum.
latevittata, Schum.
longicornis, Curt.
lunata, L. (et Auct.).
luna, Westh.
marginata, Mg.
lateralis, Mg.
vernalis, Mg.
? pendens, Harr.
vittata, Mg.
gigantea, Schrk.
maxima, Poda.
sinuata, F.
nubilosa, Harr.
lutescens, F.
fulvipennis, Dg.
oleracea, L.
terrestris, Harr.
paludosa, Mg.
selene, Mg.
fascipennis, Mg.
pelostigma, Schum.
selenitica, Wlk.
ochracea, Mg.
lunata, F., L. ?
vaga, Wlk.

DICTENIDIA, Brul.

bimaculata, L.

XIPHURA, Brul.

atrata, L.
ruficornis, Stæg.
nigricornis, Mg.

CTENOPHORA, Mg.

ornata, Mg.
flaveolata, F.
pectinicornis, L.
splendor, Harr.
nigrocrocea, Dg.
variegata, F.

REPUTED BRITISH SPECIES OF *TIPULIDÆ*, &c.

Dixa serotina, Mg., Sys. Bes., I, 217; Curt., B. E., 409: reputed on the authority of Haliday, as occurring in Ireland on the verge of the sea. I believe Meigen's species remains unrecognised.

Limnobia fusca, Mg., Sys. Bes., I, 133; Steph., Sys. Cat., II, 244: this species also has, I believe, remained unrecognised since Meigen described it. Can it be *Dicranomyia turpis*, Wlk.? if so, Meigen has wrongly figured the position of the large cross vein.

L. pabulina, Mg., Sys. Bes., I, 140; Steph., Sys. Cat., II, 245: this must be very near *L. sylvicola*, Schum.; British Museum specimens are a *Dicranomyia*, like a dark *D. chorea*.

L. sexpunctata, F., Sp. Ins., II, 405; Steph., Sys. Cat., II, 244: probably only *L. tripunctata*, F.

L. maculipennis, Mg., Sys. Bes., I, 136; Wlk., B. M. Cat., 44: may be *D. ornata*, Mg.

L. inusta, Mg., Sys. Bes., I, 135, = *macrostigma*, Schum.?; Wlk., I. B. D., III, 298, = *D. mitis*,? Mg.

L. stigma, Mg., Sys. Bes., I, 138; Wlk., I. B. D., III, 298, = *D. mitis*, Mg.?

L. sexmaculata, Mcq., D., N. F. Tip., 91; Wlk., I. B. D., III, 303, = *Goniomyia sexguttata*, Dale.

L. plebeia, Mg., Sys. Bes., I, 127; Steph., Sys. Cat., II, 244, = *Limnophila filata*, Wlk.?

L. leucophæa, Mg., Sys. Bes., I, 127; Wlk., I. B. D., III, 290, = *L. nemoralis*, Mg.

L. albifrons, Mg., Sys. Bes., I, 137; Wlk., I. B. D., III, 295, = *D. modesta*, Mg.?

Tipula ocellaris, L., F. S., 1751; Curt., B. E., 50, = *Epiphragma picta*, F.

Erioptera montana, Mg., Sys. Bes., I, 110; Steph., Sys. Cat., II, 242.

E. grisea, Mg., Sys. Bes., I, 112; Curt., B. E., 557, = *Molophilus*; Wlk., I. B. D., III, 276, = *Erioptera! trivialis*?

Limnobia transversa, Mg., Sys. Bes., I, 123, perhaps a *Dactylolabis*; Steph., Sys. Cat., II, 245: the specimen in the British Museum is a large *Amalopis*.

Trichocera maculipennis, Mg., Sys. Bes., I, 214; Steph. Sys. Cat., II, 250.

T. parva, Mg., Sys. Bes., I, 213; Wlk., B. M. Cat., 82: the European species of *Trichocera* are too insufficiently distinguished to allow sinking this as a var. of *hiemalis* without closer examination.

Anisomera obscura, Mg., Sys. Bes., I, 210; Steph., Sys. Cat., II, 250.

A. nigra, Ltr., Gen. Cr., IV, 260; Wlk., B. M. Cat., 82, = *A. aequalis*, Lw.?

A. bicolor, Mg., Sys. Bes., I, 209; Wlk., B. M. Cat., 82.

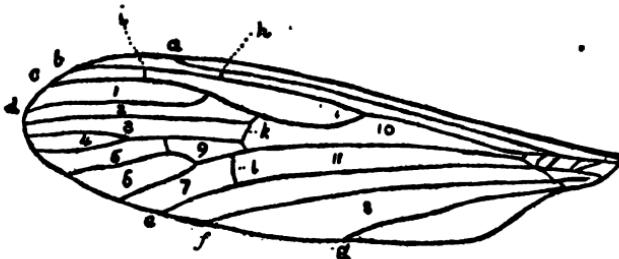
A. vittata, Mg., Sys. Bes., VI, 292; Wlk., B. M. Cat., 82, = *A. Burmeisteri*, Lw.?, or *Peronecera fuscipennis*, Curt. (t. Sohin.).

Amalopis geniculata, Mg., Sys. Bes., I, 124; Steph., Sys. Cat., II, 245: the specimen in the British Museum is a small true *Amalopis*.

Phalacrocerata replicata, L., F. S., 1755; Steph., Sys. Cat., II, 245: the only specimens I have seen were *Limnobia quadrinotata*, Mg.

Pachyrrhina pratensis, L., F. S., 1745; Wlk., B. M. Cat., 64: surely must be British, but I cannot find it.

Tipula hortorum, L., F. S., 1741; Steph., Sys. Cat., II, 248.
T. excisa, Schum., Bes. Schles. Tip., 42; Wlk., I. B. D., III, 323: undoubtedly *T. scripta*, Mg.
T. arctica, Curt., Ross. Exp., 77, T. A., 15; Dale, Ent. Mo. Mag., XX, 214, = *nodulicornis*, Ztt.
T. irrorata, Meq., Sui. à Buff., I, 84; Curt., B. E., 493.
T. Diana, Mg., Sys. Bes., I, 189; Wlk., B. M. Cat., 62.
T. fenestrata, Schum., Bes. Schles. Tip., 59; Wlk., B. M. Cat., 60.
T. cæsia, Schum., Bes. Schles. Tip., 65; Wlk., B. M. Cat., 61.
T. fimbriata, Mg., Sys. Bes., I, 190; Wlk., I. B. D., III, 327: under this name I have only seen *T. paludosa*, Mg.
T. lineola, Mg., Sys. Bes., I, 181; Wlk., I. B. D., III, 323.
T. selenitica, Mg., Sys. Bes., I, 187; Wlk., I. B. D., III, 329, = *T. peliostigma*, Schum.

Neuration of *Cladura*, adapted after Osten-Sacken.

Costal vein = upper edge.		Prefurca = part of radial vein	Submarginal cells	1 & 2
Mediastinal vein ends at		a from its origin until its forks.	Posterior cells.....	3 to 7
Subcostal " "		b Subcostal cross vein	h Anal cell	8
Radial " "		c, d Marginal	i Discal cell	9
Postcostal " "		e Small	k Basal cells	10, 11
Axillary " "		f Great	l	

- 1 (4) Anal vein absent.
- 2 (3) Thorax without any transverse suture *Dixa*.
- 3 (2) Thorax with a transverse suture *Ptychoptera*.
- 4 (1) Anal vein present.
- 5 (68) Mediastinal vein ending in the costal and connected with the subcostal by the subcostal cross vein; last joint of palpi shorter or not much longer than the two preceding joints taken together..... *LIMNOBIADE*.
- 6 (25) One submarginal cell.
- 7 (14) Antennæ 14-jointed (empodia indistinct or none) *Limnobiinae*.
- 8 (13) Proboscis not longer than the head.
- 9 (12) Antennæ simple.
- 10 (11) Tip of the mediastinal vein usually far beyond the origin of the prefurca; the ♂ forceps consists of two horny hooks *Limnobia*.
- 11 (10) Tip of the mediastinal vein usually about opposite the origin of the prefurca; the ♂ forceps consists of two fleshy lobes *Dicranomyia*.
- 12 (9) Antennæ pectinate or sub-pectinate *Rhipidia*.

13 (8) Proboscis longer than the head and thorax together *Geronomyia*.
 14 (7) Antennæ 16-jointed.
 15 (22) Subcostal vein ends in the costal ; tibiae without spurs at the tip .. *Rhamphidiinae*.
 16 (17) Proboscis at least twice as long as the head *Rhamphidia*.
 17 (16) Proboscis shorter than the head.
 18 (19) Discal cell closed *Antocha*.
 19 (18) Discal cell open.
 20 (21) Discal cell coalescent with second posterior cell *Orimarga*.
 21 (20) Discal cell coalescent with third posterior cell *Thaumastoptera*.
 22 (15) Subcostal vein usually incurved towards the radial, and ending in it ; tibiae always with spurs at the tips *Cylindrotominae*.
 23 (24) Upper vein from discal cell forked *Cylindrotoma*.
 24 (23) Upper vein from discal cell not forked *Liogma*.
 25 (6) Two submarginal cells (empodium distinct).
 26 (43) Tibiae without spurs at the tip *Eriopterinae*.
 27 (34) Wings conspicuously hairy, at any rate along the veins.
 28 (29) Wings conspicuously hairy on the whole surface *Rhypholophus*.
 29 (28) Wings conspicuously hairy on the veins only.
 30 (31) The prefurca ends in the first submarginal cell, which is longer than the second ; the great cross vein much nearer the base of the wing than the small one is *Molophilus*.
 31 (30) The prefurca ends in the second submarginal cell, which is longer than the first ; the great and small cross veins are nearly in a line.
 32 (33) The axillary vein is arcuated so much that the anal cell is broader in its middle than near its margin *Erioptera*.
 33 (32) The axillary vein is straight, diverging from the anal, so that the anal cell is much broader at its end than in its middle *Acyphona*.
 34 (27) Wings not conspicuously hairy on the surface, and very slightly on the veins.
 35 (38) First submarginal cell remarkably short, not more than half as long as second.
 36 (37) Marginal cross vein present *Empeda*.
 37 (36) Marginal cross vein absent *Goniomyia*.
 38 (35) First submarginal cell much more than half the length of the second.
 39 (42) The subcostal cross vein a long way from the tip of the mediastinal (more than twice the length of the great cross vein).
 40 (41) Axillary vein conspicuously bisinuated *Symplecta*.
 41 (40) Axillary vein straight *Trimiera*.
 42 (39) The subcostal cross vein is close to the tip of the mediastinal... *Lipsothrix*.
 43 (26) Tibiae with spurs at the tip (even though minute).
 44 (61) Subcostal cross vein *after* the origin of the prefurca.
 45 (58) Antennæ 16-jointed *Limnophilinae*.
 46 (57) Axillary vein nearly straight (not short).

47 (48) An extra cross vein between the mediastinal and costal veins...
Epiphragma.

48 (47) No extra cross vein between the mediastinal and costal veins.

49 (52) An extra cross vein in the second basal cell.

50 (51) Antennæ long and thin *Idioptera.*

51 (50) Antennæ short, very much thickened at the base *Ephelia.*

52 (49) No extra cross vein in the second basal cell.

53 (54) Great cross vein almost opposite base of discal cell *Dactylolabis.*

54 (53) Great cross vein near middle of discal cell.

55 (56) Wings with numerous dark dots *Pæciolostola.*

56 (55) Wings almost without spots *Limnophila.*

57 (46) Axillary vein very short, abruptly incurved to anal angle ... *Trichocera.*

58 (45) Antennæ 6—10-jointed *Anisomerinae.*

59 (60) Antennæ apparently 6-jointed (♂), or 10-jointed (♀) *Anisomera.*

60 (59) Antennæ apparently 7-jointed (♂), or 9-jointed (♀).... *Peronecera.*

61 (44) Subcostal cross vein before the origin of the *præfurca*..... *Amalopinae.*

62 (63) Antennæ 13-jointed *Dicranota.*

63 (62) Antennæ 16—17-jointed.

64 (65) Four posterior cells, wings pubescent *Ula.*

65 (64) Five posterior cells, wings glabrous.

66 (67) Small cross vein nearly upright; last joint of palpi not longer than two preceding joints taken together *Amalopis.*

67 (66) Small cross vein very oblique; last joint of palpi longer than the three preceding joints taken together *Pedicia.*

68 (5) Mediastinal vein ending in the subcostal, no cross vein between it and each vein running along side; last joint of the palpi very long, whip-lash shaped, much longer than the three preceding joints taken together *TIPLIDÆ.*

69 (70) Discal cell absent; tibiæ without spurs *Dolichopeza.*

70 (69) Discal cell present; tibiæ spurred.

71 (76) Antennæ not pectinated.

72 (73) Antennæ 19-jointed (♂), or 15-jointed (♀) *Nephrotoma.*

73 (72) Antennæ 13-jointed.

74 (75) The three veins from the discal cell usually start separate, or the upper two from a common base; yellow and black species ... *Pachyrrhina.*

75 (74) The discal cell emits two veins, the upper one forking at some distance from the cell; not yellow and black species *Tipula.*

76 (71) Antennæ pectinated (♂).

77 (78) Antennæ (♂) pectinated only on the inner side *Dictenidia.*

78 (77) Antennæ (♂) pectinated inside and outside.

79 (80) Antennæ (♂) pectinated beneath *Xiphura.*

80 (79) Antennæ (♂) not pectinated beneath *Ctenophora.*

LIMNOBIA.

1 (18) Origin of radial vein far before end of mediastinal vein.

2 (7) Subcostal vein ends with, or before, the cross vein which unites it to the radial vein;

- 3 (4) Wings without sharply defined spots (and no spots much nearer base than is the origin of radial vein) and with no clouds ... *bifasciata*, Schrk.
- 4 (3) Wings with sharply defined spots (one or more nearer base than is the origin of radial vein) and with numerous clouds.
- 5 (6) Femora with two sharply defined black rings. (Very large species) *annulata*, Mg.
- 6 (5) Femora with only one sharply defined terminal black ring... *quadrirotata*, Mg.
- 7 (2) Subcostal vein continued much beyond the cross vein which unites it to the radial vein.
- 8 (17) Wings with spots and clouds, or at any rate, three black spots near costa.
- 9 (14) Thorax chiefly blackish or dark, never shining clear ochreous with a single black middle line. (Wings more or less clouded).
- 10 (13) Wings clouded all over, with spots near costa somewhat more defined ; joints of antennæ elongate, bearing hairs nearly three times as long as each joint (♂), or much longer than joint (♀).
- 11 (12) Femora with three (or at least two) clearly defined dark rings .. *nubeculosa*, Mg.
- 12 (11) Femora with only the tip distinctly dark (a pale ring preceding) *flavipes*, F.
- 13 (10) Wings with slight cloudings, and three blackish spots near costa ; joints of antennæ oval, bearing hairs rather longer than each joint... *nitida*, n. sp.
- 14 (9) Thorax shining clear ochreous, with a black middle line in front. (Wings not in the least clouded, but with three dark spots near costa).
- 15 (16) Front femora black, the basal third luteous *nigropunctata*, Schum.
- 16 (15) Front femora with only a ring just before the tip black, before which seems to be a paler ring *tripunctata*, F.
- 17 (8) Wings clear, no markings or spots at all..... *trivittata*, Schum.
- 18 (1) Origin of radial vein nearly opposite end of mediastinal vein... *macrostigma*, Schum.

L. NITIDA, n. sp. (♂ ♀).—*Atra, nitida, alis nigro-punctatis et nebulosis, abdome nigro segmentis quatuor mediis apiceque fulvis, femoribus rufo-flavis, omnibus apice, anticis in medio nigris, tibiis tarsisque obscuris.*

This species must be exceedingly near *L. pannonica*, Kowarz (Verh. z.-b. Wien., xviii, 213), and I should have no doubt that either that or this was *L. analis*, Meig., but for Meigen's positive statement that his *L. analis* was only *L. flavipes*, F. ; I know, from specimens in the British Museum, that Walker's *L. analis* is *L. nitida*. It comes between *L. nubeculosa*, Mg., and *flavipes*, F., on the one side, and *L. nigropunctata*, Schum., and *tripunctata*, F., on the other side, but differs from all in its shining black thorax and more darkly marked wings ; it is slightly the smallest of all ; the black ring on the front femora, and the strongly darkened wing tip, are similar to those in *L. nigropunctata*, but that species has the wing perfectly free from cloudings ; from *L. pannonica* I note the following distinctions (according to description) :

L. pannonica, Kow.

Abdomen and belly shining black.

Besides the three blackish spots near the costa, there are similar small spots before the third large spot and at the end of the subcostal vein; venation like *L. tripunctata*.

Halteres yellow.

Antennæ all blackish, except base of third joint.

Scutellum yellowish-brown, darkened on middle.

L. nitida has the veins all yellow at the base of the wing; the tibiae are almost black, being only a little brownish about the middle; the black on the 7th and 8th abdominal segments is a conspicuous band between the reddish-yellow middle of the abdomen and the genitalia, these being all reddish-yellow except the black hooks, outside they bear black hairs, but inside near the end yellowish hairs.

Female very similar to the male, but the hind margins of the reddish-yellow abdominal segments are distinctly black; the ovipositor is almost all reddish-yellow.

This does not appear to be rare in England, as in addition to several specimens in the British Museum I came against it many years ago in the Plumstead Marshes when I knew nothing about *Tipulidae*, and this spring on May 12th it occurred freely in a hedgerow at Exning near Newmarket. It is probably a May species, lasting only a few days; my Plumstead specimens were taken on May 4th.

L. trivittata, Schum.: this species, which is usually considered rare wherever it occurs in Europe, was very abundant on one of the islands in the river at Inverness on July 10th last; on June 26th I took one at Brockdish near Scole in Norfolk, so I suspect it is widely spread but hitherto overlooked. Walker's type of *L. punctigera* is certainly a true *Limnobia*, but when I saw it I did not know *L. trivittata*.

L. macrostigma, Schum.: tolerably abundant near Tunbridge Wells last June.

(To be continued.)

NOTES ON THE *LEPIDOPTERA* OF THE BIRMINGHAM DISTRICT :
A RETROSPECT.

BY W. HARCOURT BATH.

The ordinary observer could not have failed to notice the changes which have taken place in the Fauna and Flora of the Birmingham District within the last fifty years.

The Fauna and Flora of any country or district are not absolutely identical for any two successive periods, however brief. Some species are gaining ground, others losing it, while yet others remain practically stationary amidst their many fluctuations. These changes are perpetually going on, but *very few of them are placed on record*.

In the course of a few years, the general changes may be inappreciable to the ordinary observer, but, locally, there are often considerable changes which cannot fail to be detected by close scrutiny. These changes are links in the great chain of changes whereby the Fauna and Flora of one geological period are considerably modified and gradually converted into the Fauna and Flora of the succeeding period. But, in the different groups of animals and plants, these changes progress at markedly different rates. Some will change rapidly, while others will hardly change at all.

As a general rule, the change seems to be slowest among the least specialized forms and among those which have been established the longest—the most speedy among the most specialized forms and such as have only lately been introduced.

The *Lepidoptera* in particular have undergone many great and important changes—even during the last few years. The lists of fifty years ago are no longer trustworthy guides.

We have records of many species occurring in the district which are now extinct. Others, which were very plentiful, are now only occasionally seen. Others, again, which were widely distributed throughout the area of the Tame Valley, have become restricted, perhaps, to one or two localities, and so reduced in numbers that we may safely venture to predict that within a few years hence they will be entirely extirpated. On the other hand, there are very few species multiplying their numbers or widening their area of distribution to compensate us for such losses.

I will now proceed to give a few examples to illustrate my argument:—

Not many years ago, probably even within the last fifty or sixty years, the gorgeous swallow-tail (*Papilio Machaon*) used to roam throughout the Midlands.

Now, however, it is entirely restricted to the Fens of Cambridge, Norfolk, and Huntingdon. Another magnificent butterfly, the Purple Emperor (*Apatura Iris*), used to occur abundantly about fifty years ago in many of the large oak woods with which the district then abounded, but it is now entirely extinct. In this case I think its disappearance may be attributed more to climatic influences than to drainage and cultivation, for its pabulum, the oak, is still very plentiful everywhere.

Within more recent years, the two pretty butterflies, *Melanargia Galathea* and *Lycena Corydon*, have both become extinct in the only locality which they frequented in the district, namely, at Knowle.

Then again, *Lycena semiargus* used to occur plentifully at Shirley, and was also taken in Sutton Park by that energetic collector the late Richard Weaver, and others. Mr. Frederick Enock attributed its disappearance in the former locality to the ravages of picture makers. If we can accept, also, the records concerning other captures made by the late Richard Weaver (which I see no reason to doubt), the goddess Fritillary (*Argynnis Dia*) and the Large Copper (*Polyommatus dispar*) used to occur in Sutton Park about fifty or sixty years ago. Concerning the former insect (*A. Dia*), I have recently been informed by the Rev. Bernard Smith (late of Ascott College), who knew Mr. Weaver personally, that the identity of the insects (two in number) in the cabinet of the fortunate collector was established by a friend, for then Mr. Weaver was only a beginner, having taken up the study of Entomology to benefit his health.

The fraud attributed to him by less fortunate collectors of palming off foreign insects as British is entirely without foundation, as Mr. Weaver did *not* collect foreign insects, for he used to say that the British were more beautiful. (The insular prejudice held its sway in those days).

Mr. Montagu Browne, F.Z.S., Curator of Leicester Museum, informs me that he saw the specimens of *A. Dia* and the single specimen of *P. dispar* in Aston Hall Museum (Birmingham) about ten years ago—the same that were reputed to have been caught in Sutton Park by Mr. Weaver.

The above two *Rhopalocera* are undoubtedly now extinct. There are many species which have become locally extinct or scarce in the district.

The three large Fritillaries, *Argynnis Aglaia*, *A. Paphia*, and *A. Adippe*, used to occur not uncommonly in Sutton Park about thirty or forty years ago, as Mr. Browne informs me, but they are now either extinct or rarely met with there.

Then again, the greasy Fritillary (*Melitaea Aurinia*) used to occur about ten or twelve years ago in several places in Sutton Park. It was most abundant in the bogs near Blackroot Pool, but since the land has been drained, and the Midland Railway cut through, not a single specimen has been seen thereabouts.

The only other locality for this insect in Sutton Park, so far as I am aware, is near Longmore Pool, where a few specimens are annually seen.

There is no doubt that *drainage* and *cultivation* are the principal causes of the extirpation of many insects. Another butterfly, the Common Blue (*Lycena Icarus*), used to occur abundantly in one spot near the Keeper's Pool, but about 10 years ago it suddenly vanished and not a single specimen has been seen in the Park since. The insect occurs in the fields in the neighbourhood of Sutton Coldfield, but is very rare. Its relative, the Holly Blue (*Lycena Argiolus*), formerly enjoyed a much

wider distribution than it does at the present day, for we have records of its having occurred in Coventry, Bromsgrove, and many other places, but the only locality for it now in the neighbourhood of Birmingham is Sutton Park.

This famous pleasure resort for the Birmingham public seems to have been a much finer hunting ground for the entomologist than it is at the present day, in fact, only a few years ago there were many butterflies which were found in tolerable plentifulness, but which are now seldom seen there. The most noticeable are, perhaps, *Gonepteryx rhamni*, *Vanessa Io*, *Pararge Megaea*, and *Epinephele Janira*. The two latter I believe are almost extinct. I have only taken a single specimen of *E. Janira* within recent years, and that one I captured in the marshes near Blackroot Pool, in 1883. Its singular absence in the neighbourhood of Sutton Coldfield is worthy of remark, being a very common butterfly in most districts throughout the Midlands. The beautiful Emperor Moth (*Saturnia pavonia*) also used to be very plentiful in Sutton Park about ten years ago, but it is now comparatively scarce. This may be attributed to two causes: 1, to the extensive fires which have recently raged in parts of the Common where the insect was most plentiful; 2, to the greediness of collectors and rapacious picture dealers who take every specimen they come across.

On the other hand we have very few insects becoming abundant to compensate us for this "falling off," still, there are some species which are apparently becoming more plentiful and widening their area of distribution. The most important are, perhaps, *Colias Edusa* and *C. Hyale*. Not many years ago both these insects were looked upon as great rarities. They are now, however, probably to be met with somewhere in the district every season. In 1877 they both occurred throughout the Midlands in great abundance. I think their increase may be attributed to the same influence which is acting the reverse with such a number of other species, namely, cultivation—the extended cultivation of various tracts of clover by agriculturists, this plant constituting the pabulum of both species. In this country *C. Edusa* occurs more commonly than *C. Hyale*, the reverse being the case on the continent.

The great Death's Head Moth (*Acherontia Atropos*) is another insect which is becoming more plentiful with us and increasing its area of distribution. Then there is the Alder Moth (*Acronycta alni*) which formerly was regarded as a rarity of the first magnitude, but which has now become of sufficient plenty for almost every collector to be in possession of one or more in his cabinet.

The fact of many rare *Sphingidae* having of late years been taken in the immediate neighbourhood of Birmingham, such as *Deilephila lineata*, *Charocampa celerio*, *C. nerii*, and other austral forms may be referred to their being introduced at various times with foreign greenhouse plants.

The remarkable *fluctuations* in the appearance of many insects would afford a fertile topic in itself. During a certain year a particular insect suddenly becomes abundant, though for several years previously it may have been very rare and only occasionally seen. In 1884 the Red Admiral (*Vanessa Atalanta*) occurred throughout the district in the utmost profusion, though for several years previously it had been comparatively scarce. In the same year, too, our gardens were visited by an innumerable horde of the Large Whites (*Pieris brassicae*), though for several years it had been very scarce. Other *Lepidoptera* which I have noticed to greatly fluctuate in their appearance are *Vanessa cardui*, *Porthesia similis*, and *Plusia gamma*, all of which occurred in unusual abundance in the neighbourhood of Birmingham in the autumn of 1879.

The Gold Tail Moth (*P. similis*) was so plentiful in the neighbourhood of Perry Barr that it covered the hedgerows like "flakes of snow." Since 1879 all these insects have been much less plentiful.

With respect to *V. cardui* and *P. gamma*, their unusual abundance in 1879 seemed to have been general throughout the British Isles, for correspondents in Ireland and the north of Scotland inform me that both species were very abundant there during the same year.

Now I am inclined to think that a considerable percentage of the unusual and sudden appearances of particular insects are referable to *migration*.

Vanessa cardui is an insect which possesses a very wide area of distribution, being found in nearly every country in the globe. It is one of those insects in which a strong migratory instinct appears to be developed. Gathering together in enormous clouds they quit the place of their birth and depart in search of "fresh fields and pastures new."

The Painted Lady is a butterfly that produces two broods in the year, and hibernates in the perfect state. When one of these large migratory hordes reaches this country it generally appears to be composed of those insects that have hibernated such hordes reach our shores in June or about that time.

If the swarm is a large one the butterflies spread over the Island, if, on the other hand, the swarm is a small one, the range is more restricted.

The butterflies then breed and die. The first brood is produced in August when the imagines again in their turn deposit ova on the thistles, and die. In our British climate, thistles and kindred plants die early in the autumn, and before the *larvæ* can feed them on the chilly nights have withered the food plants. Starved with cold and hunger, the *larvæ* fall victims to our climate, so that the second brood which ought to live over the winter to continue the race over another year never reaches maturity, and the species disappears. It may happen, however, sometimes that a few of the first brood emerge so late that they hibernate or emerge so early that the progeny passes through the various stages and does the same. Either of these occurrences would carry the race on for another season, but it does not seem possible for this to last more than a year or two. The species is then lost until a fresh migration makes it abundant once more. *Vanessa Antiope* is another insect whose phenomenal appearances may in my opinion be referable to the same theory of migration, although the differences in colour between British and Continental specimens require a little investigation.

There are many other insects which, independent of migration, appear sometimes in immense numbers locally, such as *Lobophora viretata*, *Thecla rubi*, and other local species which are usually the reverse of abundant. Then again, others which are usually tolerably abundant, such as *Polyommatus Phlaeas*, *Euchloë cardamines*, and *Pieris napi* are very scarce in certain seasons.

The recent progress of science forcibly teaches us that the grandest and safest conclusions are best attainable by means of the most minutely accurate observations persistently conducted according to some well arranged and comprehensive plan.

In the cases above cited, numberless experiments are being carried

out before our eyes, and, if we are to profit by them, we must watch them with the closeness of vision and keenness of intellect demanded by the physicist in his laboratory.

The Limes, Sutton Coldfield : *October 11th, 1886.*

NOTES ON THE COLEOPTERA OF THE ISLE OF SHEPPEY.

BY G. C. CHAMPION, F.E.S.

For the last eighteen years, except when absent abroad, Mr. J. J. Walker and I have paid a great deal of attention to the Coleopterous fauna of the Isle of Sheppey. Our list contains at present about 900 species. The island is, or used to be, rich in salt-marsh frequenting species. Having spent the greater part of the month of August, part of the time in company with Mr. Walker, in the island, I have again had an opportunity, after a lapse of several years, of paying a little more attention to the subject. The following species, among others, were met with and seem noteworthy ; those marked * have not hitherto been recorded from, or are noted by us for the first time in the island.

Cillenum laterale :* sparingly, under stones below high-water mark.

Helophorus intermedius : this species used to abound in the brackish ditches ; latterly I have only seen it crawling on the esplanade, not uncommonly.

Ochthebius exaratus : not uncommon, in company with three other species of the genus, in fresh or brackish ditches.

Cercyon aquaticus :* rarely, in the above-mentioned "traps."

Homalota peregrina : sparingly, by evening sweeping on the edge of the cliffs, and also from rubbish on the banks of the ditches ; this tiny little species is found in company with *H. inquinula* (and numerous other species of the genus), and is difficult to detect in the net amongst the larger common species. *H. cæsula* :* not uncommon in one little sandy spot ; in short moss, as at Deal and elsewhere.

Diglossa mersa :* rather common, beneath large boulders on the beach, and below high-water mark.

Myllena elongata :* rarely, on the banks of the ditches.

Philonthus punctus :* rarely, in two widely separated localities ; in "traps" of water plants pulled out of the fresh water ditches and left a few days to dry on the banks, and in a partially dried up reedy piece of marsh ground. This is the first time I have seen the species alive, though the insect is a known inhabitant of the island ; we had long been looking for it.

Homalium pygmaeum :* one example, evening sweeping.

Actidium coarctatum :* not uncommonly, in company with *Diglossa*, and also beneath seaweed.

Hydnobius strigosus,* *Anisotoma calcarata*, *Cyrtusa pauxilla*,* and *Colon brunneum* : rarely, by evening sweeping on the edge of the cliffs.

Synchypta hirsuta : rarely, by evening sweeping.

*Throscus carinifrons** and *obtusus* : the first-named not uncommonly, the latter rarely, by sweeping just before dark (not earlier) along the edge of the cliffs. The four British species of the genus are now known to us from the island.

Xylophilus populneus :* rarely, by evening sweeping.

Salpingus ater :* two examples, evening sweeping on the edge of the cliffs. This insect seems to occur sporadically in widely separated localities. Visiting Sittingbourne a short time after, we again met with a pair of the species.

Bagoës subcarinatus and *frit* : not uncommonly, beneath "traps" (*Ranunculus aquaticus*, *Lemna*, &c.) on the banks of fresh water ditches. Of the hundreds of specimens we have captured of the five species of *Bagoës* inhabiting the island, by far the majority have been found by this method or in flood refuse ; it is only on rare occasions we have found them by sweeping or in the water net. *B. subcarinatus* can always be identified amongst its British allies by its long and slender tarsi.

Trachyphlaeus alternans :* rarely, in a little sandy spot. This is another species occurring more or less sporadically (though often found in numbers) in very many localities in the South of England, both on the chalk and on the sand.

Apion limonii : in profusion, in a new and distant locality, at Leydown. This species had long since disappeared from its old locality near Sheerness ; it selects saltings not covered by high tides. The withered state of the leaves of its food-plant will generally indicate its presence.

Apion Schönherri : a single example, by sweeping. This species was formerly found by us in profusion in moss, &c., on the banks of fresh water ditches, in winter ; very rarely in the summer months single specimens have occurred by sweeping.

Hæmonia Curtisi : rarely, in slightly brackish ditches, on *Potamogeton pectinatus*.

Engis humeralis : rarely, in fungus on elms, in company with swarms of *Mycetophagus quadripustulatus* and *Triphyllus suturalis*. In the New Forest, I have only found this species in fungoid growth on beech.

Just before sunset on calm evenings, or, better still, when there is a slight breeze from the land, enormous numbers of the commonest beetles may be found by sweeping along the extreme edge of the cliffs, and amongst these now and then rarer species are to be met with, the difficulty being to detect amongst such a struggling mass of life any small or obscure forms. The most abundant species belong to the genera *Sitones*, *Apion*, *Atomaria*, *Bradyceillus*, *Trechus*, *Oxytelus*, *Homalium*, *Lagria*, *Meligethes*, *Phalacrus*, *Cercyon*, *Typhaea*, *Aleochara*, *Olibrus*, *Orthoperus*, *Lathridius*, *Stenus*, *Bruchus*, *Homalota*, *Ceuthorhynchus*, *Lithocharis*, *Peylliodes*, *Corticaria*, *Philonthus*, *Philhydrus*, &c., &c. ; more rarely, *Leucoparyphus*, *Helophorus* ; we have obtained, in addition to those already mentioned, *Haploglossa*, *Hylobius* (!), *Autalia rivularis*, *Apion pubescens*, *Cionus blattariae* (for the first time in Sheppeney), *Ochina*, &c. Many visits in search of *Baridius scolopaceus* were quite fruitless ; the insect appears to have become extinct in its old locality.

11, Caldervale Road, Clapham, S.W. :
September 25th, 1886.

DESCRIPTION OF THE LARVA OF *PTEROphORUS*
ACANTHODACTYLUS.

BY G. T. PORRITT, F.L.S.

At page 149 of the last (xxii) volume of the Ent. Mo. Mag., is a description of the larva of *Pterophorus cosmодactylus*; a reference to it will show that in the year 1884, Mr. Eustace R. Bankes, of Corfe Castle, sent me about a score of larvæ of a *Pterophorus*, from which I bred a series of *cosmodactylus* and two specimens of *acanthodactylus*. Last year, Mr. Bankes sent me another lot of larvæ, from which I bred *cosmodactylus* only. Notwithstanding this large proportion of *cosmodactylus*, Mr. Bankes has all along been convinced that in reality *acanthodactylus* is much the commoner insect in his district; and, therefore, again this year collected and sent me thirteen more larvæ from the *Stachys sylvatica*. They reached me on August 25th, and, on opening the box, at first sight they appeared to me just like those received the two previous years; they were of the same shape, and there was precisely the same range of variation from the bright green to purple forms. Two days afterwards, however, on comparing them closely with my descriptions of the previous years' larvæ, it at once became apparent that there were distinctly defined distinctions between them; so much so, that I at once wrote to Mr. Bankes stating I fully expected to breed *acanthodactylus* from them. On the 7th of September a further consignment of larvæ reached me from my friend Mr. W. H. B. Fletcher, of Worthing, who sent them (evidently without any doubt on his part) as *acanthodactylus*. They seemed in every respect like Mr. Bankes' larvæ, so that I was now all but certain it would be proved these two closely allied species can be separated in the larval stage. The result was perfectly satisfactory, for from Mr. Bankes' larvæ I bred thirteen *acanthodactylus*, from September 7th to 14th; and from Mr. Fletcher's, five specimens, the first appearing on September 21st. It seems almost inexplicable that this year Mr. Bankes should collect no *cosmodactylus* larvæ whatever, for he retained a good many himself, and when writing me early in September, he had up to that time bred forty specimens—all *acanthodactylus*!

DESCRIPTION.—In shape exactly like that of *cosmodactylus*, as described in the Ent. Mo. Mag., xxii, 150. As in that species there are two distinct forms, and intermediate varieties occur partaking more or less of each of these extreme forms:—

Var. I has the ground colour deep purple; head yellowish-grey, or yellowish-brown, marked on the crown and sides with black, the mandibles brown; mediodorsal stripe smoke-coloured; sub-dorsal lines, and another line of equal width

below it, white, but interrupted and not very conspicuous; and below these is another scarcely so pale line along the spiracles; hairs and the distinct tubercles white. Ventral surface and prolegs greenish-olive, anterior-legs shining black, ringed with paler.

Var. II has the ground-colour bright pale green; head as in Var. I; the pulsating dark smoky vessel—in some specimens tinged with pink anteriorly—forms the dorsal stripe; sub-dorsal lines indistinct, whitish; below these is another line, but much interrupted and broken into short lengths; there are no lines along the spiracular region; hairs and tubercles white. Ventral surface and prolegs of the bright green of the dorsal area, the legs shining black, ringed with white.

From the foregoing it will be noted, that the chief points of distinction between this insect and *cosmodactylus*—distinctions which will probably be found to be reliable—are: the deep purple ground-colour in *acanthodactylus*, as compared with the “purplish-pink” of *cosmodactylus*; the white sub-dorsal lines being less conspicuous in *acanthodactylus*; and the head being yellowish-brown marked with black, in place of the “very dark sienna-brown, almost black,” in *cosmodactylus*.

Huddersfield: October 8th, 1886.

A LUMINOUS INSECT-LARVA IN NEW ZEALAND.

BY C. R. OSTEN-SACKEN, HON. F.E.S.

Mr. Hudson's account (*ante*, pp. 99–100) about the luminous insect-larva from New Zealand leaves me very little doubt that it belongs to the *Mycetophilidae*. The description of the “glutinous web,” the rapid motions of the larvæ gliding upon it, and their retreat into holes, when alarmed, show a remarkable agreement with my observations on the larvæ of *Sciophila*, described in detail in my article: “Characters of the larvæ of the *Mycetophilidae*,” in the Proceedings Entom. Soc. Philad., 1862 (I have recently reprinted this article as a separate pamphlet for distribution among my correspondents). Whether my *Sciophila* larvæ were shining or not, I can neither affirm nor deny, because I do not remember seeing them in the dark. But we have another observation of luminous larvæ of *Mycetophilidae*, that of Wahlberg, Act. Holm., 1838 and 48. He observed the transformations of *Ceroplatus sesiooides*, and saw larva and pupa, but not the perfect insect, emit a bright light. His paper will be found translated in the Stett. Ent. Zeit., 1849, pp. 120–123. There is no doubt now that the fly *Trimicra pilipes* was bred from some other larva hidden in the mud which contained the luminous larvæ; one of the “small earthworms” mentioned may have been that very larva. To make assurance doubly sure, I wrote to Mr. Theod. Beling, in Seesen (in the Harz mountains), who reared larvæ of *Trimicra*, and published descriptions; upon my suggestion he took the trouble to hunt up such

larvæ again, as they were in season, and to watch them in the dark ; no trace of luminosity was visible. Thus it remains only to ascertain to what genus of *Mycetophilidae* the New Zealand larvæ belong.

I notice, by the way, that in my statement about luminous *Diptera*, in the Ent. Mo. Mag., xv, p. 43, I forgot to mention Wahlberg's observation.

Heidelberg : October, 1886.

Aculeate Hymenoptera in 1886.—As I have been successful in capturing a considerable number of scarce and local *Hymenoptera*, a record of some of the best of these may not prove to be without interest. During May and the greater part of June I was at Oxford ; the last two or three days of July and the first ten days of August I spent at Sidmouth. To species that were found in these two localities I shall affix the name of the locality where I found them ; where no locality is mentioned, it is to be understood that the species was caught within walking distance of Chippenham.

As no really scarce species of the *Heterogyna* was found, I record none of this section. Of the *Fossores* I have taken—

Myrmosa melanocephala, Fab. : two ♂ and several ♀ ; the latter sex also at Sidmouth.

Aporus unicolor, Spin.—of this rare species I was lucky enough to take one ♀ at Sidmouth.

Evagethes bicolor, Lep.—one ♀ at Sidmouth.

Of the genus *Pompilus* : *niger*, Fab., was common, but so difficult to catch, that I only secured about half a dozen—I took a single ♂ at Sidmouth ; *spissus*, Schiödte, was generally common in our woods.

Priocnemis was very well represented, several good species being found : *fusca*, Linn., at Oxford ; *exaltatus*, Fab., common at Sidmouth ; *pusillus*, Schiödte, both sexes, but not commonly ; *parvulus*, Dahlb., both sexes, rarely ; *hyalinatus*, Fab., one ♂ at Sidmouth.

Agenia variegata, Linn.—widely distributed, but not very common ; it is to be found running over walls, heaps of road-scrapings, banks, on willow and other tree trunks, and on old stumps. I have taken ♂ and ♀ in cop., and the latter sex with its prey (a spider), as is usual with the *Pompilidae* : *hircana*, Fab., much more local than the former species, but not very scarce where it is found. I have only taken it on tree trunks, and once or twice on a stump.

Ceropales maculatus, Fab.—not uncommon in woods.

Astata boops, Schr.—I found the ♀ with its prey at Sidmouth.

Spilomena troglodytes, V. d. Lind.—two ♀ in a quarry.

Mimesa Dahlbomi, Wesm.—in the woods, but not commonly.

Crabro clavipes, Linn.—this species and several others seem particularly fond of plum leaves in gardens. I suspect that they come in search of the *Aphides*, which are often so abundant on these trees ; *capitatus*, Shuck.—the ♂ was found in our garden ; *gonager*, St. Farg.—I took three or four ♂ and a few ♀ at Wootton-under-Edge, near here, where the first specimens were taken. I was very pleased to

find a new locality about twelve miles from the original one, where I took several ♀. At Wootton it forms its burrow in decaying stumps, in the new place in a stiff clay soil; *interruptus*, De Geer—I found only one ♀ of this uncommon species.

Odynerus pictus, Curt., was not very common, and *antilope*, Panz., even less so.

Many scarce species of the *Anthophila* were found. Among the *Andrenidae*: *Prosopis confusa*, Nyl., was not rare on bramble blossoms in woods; *brevicornis*, Nyl., was less common, but was also found at Sidmouth, where I also took the ♂ of *P. pictipes*, Nyl.

Nearly all the species of the genus *Sphecodes* were taken, including *S. puncticeps*, Thoms., at Sidmouth; *S. ferrugatus*, Thoms., which occurred here in thousands and tens of thousands. In several places, where patches of *Carduus arvensis* grew, they could have been boxed in innumerable quantities after sundown on warm evenings, five or six specimens being found on every blossom. The ♀ I took at Oxford in the spring. *S. hyalinatus*, Thoms., not quite so plentiful, but very abundant on the same thistle flowers. I took several females of this species at Oxford. *S. variegatus*, Von Hag., with the preceding, but far less plentiful; I could only secure about two dozen. *S. dimidiatus*, Von Hag., fairly common at Oxford, but of course I only took the hibernated females. *S. affinis*, Von Hag., more or less common in both places.

Andrena, Fab., was very well represented: *Hattorfiana*, Fab., 1 ♂ and 5 ♀ on flowers of the common Scabious at Sidmouth; *Cetii*, Schr., 1 ♂ and 1 ♀ on the same flowers in the same place; *pilipes*, Fab., was common at Sidmouth on bramble blossoms; *rosa*, Panz., was not plentiful there, on the same flowers; *thoracica*, Fab., swarmed on nearly every flower, thistle, bramble, crepis, fleabane, and many others; *angustior*, Kirb., I took 1 ♂ and 11 ♀ of this rare species at Oxford, all the females had their legs covered with pollen, and occurred solely on the common buttercup; *bicolor*, Fab., is a common species, it is very partial to mallow blossoms and *Crepis*; *varians*, Rossi, *helvola*, Linn.—the ♂ of the former and ♀ of the latter were taken at Oxford; *fucata*, Sm., 5 ♀ at Oxford, all on whitethorn blossom; *simillima*, Sm., 2 ♂ and 8 or 9 ♀ at Sidmouth. These were chiefly taken on *Carduus arvensis*, but also on *Inula* and other flowers; *denticulata*, Kirb., both sexes at Sidmouth, but not very plentifully; *chrysocleles*, Kirb., in countless numbers in the spring, and abundant at Oxford; *humilis*, Imh., very locally at Oxford, but abundant in one place; *dorsata*, Kirb., 2 ♀ at Sidmouth on bramble blossoms; *Wilkella*, Kirb., at Oxford, very locally.

Cilissa haemorrhoidalis, Fab.—the males of this species were very abundant when I left for Sidmouth, but I only took 8 ♀; on my return they were past. It is not at all confined to the harebell; in the woods and on the hills it is found on the three species of mallow, the harebell, and the Canterbury bell; in lanes abundantly on *Geranium Robertianum*, in company with *Andrena bicolor*, Fab., *Chelostoma campanularum*, Kirb., &c. It is much preyed upon by a spider which infests these flowers, and which rushes out and strangles it as it alights.

Of the *Apidae*, both species of *Panurgus* occurred at Sidmouth. I took a single ♀ of *Nomada ochrostoma*, Kirb., here, at Oxford it was not rare; in both places it was parasitic on *Andrena Afzeliiella*, Kirb., not on *A. labialis*, Kirb. *N. obtusifrons*, Nyl., 2 ♀ at Sidmouth, one on *Senecio* and the other on *Carduus*. *N. ferruginata*,

Kirb., not rare at Oxford, with *A. humilis*, Imh. *Stelis phaeoptera*, Kirb., 1 ♀ at Sidmouth; I cut it out of a burrow that was constructed in a gate post; this was on the first day of my stay while it was raining fast.

Osmia pilicornis, Sm., 1 ♂ and 4 ♀. It burrows in dead wood and in stony ground; it is a very early spring bee, found in April on dog violet, &c., but the ♀ may be found till quite the end of June. I took one of the latter sex at Oxford on the common bugle by the road side: *fulviventris*, Panz., not uncommon in our garden; it cuts *decayed* rose leaves in a very ragged fashion, very unlike the neat work of a *Megachile*; it builds in the holes where nails have fallen out from the mortar of our garden wall: *bicolor*, Schk., 6 or 7 of each sex on dog violet, bluebell, cistus, and wood anemone: *O. leucomelana*, Kirb., 2 ♂ and 5 ♀ at Sidmouth; the ♂ settles on the bare pathways, the ♀ I only found on *Crepis*; I found one *nudus* in a buried bramble stem; unfortunately, not more than one or two cells are full, and perhaps not even these: *spinulosa*, Kirb., not very plentiful at Sidmouth.

Anthophora furcata, Panz., 4 ♀ at Sidmouth.

Saropoda bimaculata, Panz., not uncommon at Sidmouth, always on *Centaurea nigra*.

All the species of *Psithyrus* occurred, the males at any rate.

The best *Bombus* was *distinguendus*, Mor., of which 2 ♂, 1 ♀, and 1 ♀ were found.

I found stylopised specimens of *A. fulva*, Schr., ♂. *A. nana*, Kirb., ♀ at Oxford and here, and of *Halictus tumulorum*, Linn., ♂ frequently.

In conclusion, I must state that Mr. Edward Saunders has very kindly named for me a very great number of the more puzzling of these species.—ROBT. C. L. PERKINS, Sopworth Rectory, Chippenham, and Jesus College, Oxford: *Sept.*, 1886.

Chrysis ignita preyed upon by *Xysticus cristatus*.—On 4th September last in Grisel-bottom—a valley adjoining Burwell Wood near Louth in Lincolnshire—I observed a spider, *Xysticus cristatus*, Clk., on the sweetly-scented yellow flowers of the agrimony (*Agrimonia eupatoria*), preying upon a *Chrysis ignita*. This lovely little insect, which is able to roll itself up in a ball when alarmed, had been overcome by the skill of the *Xysticus*.—H. WALLIS Kew, Louth, Lincolnshire: *Oct. 6th, 1886.*

Note on some Bees and the flowers of Snapdragons.—Having this year a great quantity of *Antirrhinum majus* growing together, I have made, during the month of August, many and continuous observations of the behaviour of some kinds of bees with the flowers, which in the main corroborate those of the late Mr. E. Newman, communicated to the Entomological Society (Proceed., 1850, p. 36). He enumerates 4 kinds, but names only one (No. 1), designating the others as “*Bombus* — ?” with numbers 2 to 4; these numbers I adopt here, assuming from the identity of proceeding in the bees I have seen with that recorded by Mr. Newman that the kinds are the same; the specific names of these, and also of Nos. 5 to 7, have been kindly furnished by Mr. Edward Saunders from individuals taken in the acts mentioned.

No. 1. *Megachile centuncularis*.—This I have not seen; it is said to enter the flowers back downwards.

No. 2. *Bombus Derhamellus*, ♀.—This invariably enters the flowers back

upwards, going in so completely as to be entirely hidden, and no entomological Dogberry on day duty would suspect its presence. However, it soon comes out, its thorax striped with yellow pollen from the anthers, which it at once carries to fertilize another flower, and so on again and again: "Sic vos non vobis" may well be said of such bees as this, which thus unconsciously have contrived a double debt to pay. Mr. Newman believed this bee to be the neuter of No. 4, and this was correct if my No. 4 be the same, of which there may be a doubt (see No. 7).

No. 3. *Bombus terrestris*, var. *lucorum*, ♀.—This does not enter the flower at all. Mr. Newman says it alights on the flower stalk just below the flower, cuts a hole in the corolla close to the nectary and thrusts its tongue or labial apparatus through this to the nectary. I have, however, often seen it not only act thus, but also alight on the flower, yet never attempt to enter it, but crawl at once down the outside to the base of the corolla. I thought the size of the bee might have been against its entry, but as I afterwards saw larger bees go in, this theory was defective, it therefore appeared that it sought honey only and took the readiest way to get it. I saw no ♀ of this var.

No. 4. *Bombus Derhamellus*, ♀.—This large bee was of too great a size to get into the flower, so standing on the lower lip it opened the mouth of the corolla and thrusting itself in as far as it could thus reached the nectary, as could be seen through the sides of the tube, the posterior part of the body remaining exposed to view; when the bee came out the thorax was marked with pollen like No. 2, the ♀.

No. 5. *Apis mellifica* (Ligurian race). This (not mentioned by Newman) goes on the outside of the flower from below and proceeds to extract the honey like No. 3. Simultaneously, however, I saw other bees of this species go to the mouth of the corolla and open it, but they did not enter; they only stood on the lower lip and pushed their heads in; and I repeatedly noticed that they reached only to the polleniferous anthers with their fore-legs; so it was clear they required pollen only. I further noticed that the honey collectors went from flower to flower always on the same errand, and that the pollen gatherers acted similarly, neither taking up the occupation of the other. Here was clearly an economic division of labour.

No. 6. *Bombus terrestris*, var. *virginalis*, ♀.—This settled on the lower lip of the flower and pushed itself into the corolla as far as it could, leaving a considerable portion of its abdomen and its hind-legs in sight: this I saw repeatedly. It evidently went to the nectary for honey, for the pollen from the anthers remained thick on the thorax and was regarded as an encumbrance, as the bee occasionally rested on a leaf and did its best to get rid of the dust with its fore-legs. If it had intended to gather pollen it would not have acted in this way. It is very singular that to get the honey the procedure was so different from that of No. 3—another variety of the same species.

No. 7. *Bombus terrestris*, var. *virginalis*, ♀.—This also settled on the lower lip of the flower, and thrust itself as far as it could into the corolla, but being the largest of all the bees the whole of the abdomen remained in view. It evidently reached the nectary with its tongue; honey was the object of its action, for the pollen formed a large stripe on the thorax, and efforts like those of No. 6 were made to remove it. This may have been the "very large bee" mentioned by Newman as his No 4, in which case his belief that it was the ♀ of No. 2 was incorrect.

I did not in any instance see either No. 3 or No. 5 make the hole which always existed at the base of the corolla after a bee had examined it, and so the opening once made served for every successive visitor. In Hermann Müller's work, "The Fertilization of Flowers,"* at page 433, the fertilization of *Antirrhinum majus* by various bees is noticed, but in every case quoted the bee entered the corolla. This is the more singular, as it is said, with respect to the flowers of the allied *Linaria vulgaris*, "I have seen the honey-bee bite a hole in the spur and empty it, as Sprengel describes."

Nos. 2, 3 and 4 disappeared after the 3rd of September, at least they then came no more to the snapdragons.

The flowers exhibited countless shades and combinations of colours, from pure white to crimson, including spots and stripes, but the bees had no preference for any, going indiscriminately from one to the other.—J. W. DOUGLAS, 8, Beaumont Gardens, Lewisham : *Sept. 10th, 1886.*

Agrypnia Pagetana, Curt., and other Trichoptera in Ireland.—Referring to the note on Trichoptera from Co. Monaghan, Ireland, vol. xx, p. 142, I have again received from Miss Freeland small collections made there during the present and last summer. These include a number of *Agrypnia Pagetana*, Curt., which occurred commonly about the end of July. They differ little from specimens out of the English Fen country; their aspect is, if anything, darker. The extension of the geographical range of this species so far westward as Ireland, is interesting: for a long time it was known, as British, only from the eastern parts of England and Scotland, but quite recently it was recorded from Clydesdale.

Other species not mentioned in my former note are: *Phryganea varia*, F.; *Limnophilus affinis*, Curt.; *Sericostoma personatum*, Spence; *Goëra pilosa*, F.; *Leptocerus albifrons*, L.; *Triannodes bicolor*, Curt.; *Cæctis lacustris*, Pictet; and *Holocentropus dubius*, Ramb.

Cæctis furva, Ramb., is again represented, this time by about thirty examples (♂ and ♀).—KENNETH J. MORTON, Carlisle, N.B.: *September 8th, 1886.*

Micromus aphidivorus, Schrk. (*angulatus*, Steph.), near London.—My friend Mr. E. Saunders recently gave me a specimen of this little Hemerobid that he had beaten from *Pinus sylvestris* at West Wickham, on the 18th ult. It is one of the rarest of the British Hemerobiidae, and is here essentially sporadic, but of wide distribution, and only taken singly. I possess two other native examples, both dating from 1863: one taken by Mr. J. B. Hodgkinson at Witherslack, in the Lake District, the other near Worcester, by the late Rev. E. Horton. Stephens gave "near London," and Scotland as localities. I have seen others, but very few. On the continent its distribution is very wide, and it is often not uncommon. It occurs also in North America: I have an example from Mt. Washington in New Hampshire that is not separable from European specimens. I follow Hagen's old nomenclature in using Schrank's name, but the latter's description is very vague, and might apply to other species better than to this. Stephens' name *angulatus* should probably prevail.

* The Fertilization of Flowers. By Prof. Hermann Müller. Translated and edited by D'Arcy W. Thompson, B.A. London: Macmillan, 1883.

The other British *Hemerobiidae* that remain essentially rare are *Psectra diptera* (known only by the unique example captured by the late Mr. J. C. Dale in 1843), *Megalomus hirtus*, and *Drepanopteryx phalaenoides* (I understand from Messrs. Morton and King that search for the latter species in the locality where three specimens were found last year, has been fruitless).—R. McLACHLAN, Lewisham, London : October 13th, 1886.

The distribution of the Lepidoptera in the British Isles.—As I am compiling notes for a work on this subject, I shall be very glad of local lists of *Lepidoptera*, which, however incomplete, will be useful to me. Readers of the Ent. Mo. Mag. are requested to assist me in this desideratum. Full particulars may be had on application to—W. HARCOURT BATH, The Limes, Sutton Coldfield, Birmingham : October 11th, 1886.

Lepidoptera, and the sense of hearing.—Will any reader of the Ent. Mo. Mag. kindly inform me upon what grounds are the antennæ of *Lepidoptera* assumed to be the organs of hearing ? I think the sense of hearing in *Lepidoptera* cannot be very keen, as gathered from the fact that they seldom evince any emotion at a sound, however loud, and then when they do move I am inclined to believe that it is merely the concussion of the air which induces them to do so.* I once fired a rifle for experiment close to a butterfly and it failed to take any notice of the report—was this either through fear, indifference, or because it did not hear it ? What proofs are there that *Lepidoptera* can hear ?—ID.

Wasps and hornets in the Midlands.—This autumn there has been a great scarcity of wasps throughout the Midlands. In the spring, however, the females were very abundant, but it is probable that the quantity of wet experienced in April and May prevented them colonising. Stone fruit has been marvellously plentiful this year, and has been gathered in excellent condition on account of the absence of these fruit pests. It is remarkable how scarce hornets have become in the Midlands within the last few years. About ten or twelve years ago they were very abundant : I remember seeing a very large colony in Sutton Park, but have not observed a single specimen since.—ID.

A plague of Aphides in the Midlands.—The first week of October was abnormally warm in the Birmingham district, and favoured the development of innumerable swarms of *Aphides* (principally *Aphis nigra*), which caused great annoyance to many people as they filled the air with their multitudes. The swallows, which have not yet all left us, have been making a very big feed the last few days. Yesterday, however, we had a rather heavy thunderstorm, and also a quantity of rain during the day, which has washed the *Aphides* nearly all away. The weather, too, has become much colder, so that the insects are not likely to make a re-appearance this year.—ID.

Drymus pilicornis and other Hemiptera in the Isle of Sheppey.—The following species of *Hemiptera* have been obtained :—*Drymus pilicornis* : a single example, by

* Slightly vague. We presume our correspondent refers to a general "shock," in contradistinction to action on any special auditory organ.—EDS.

evening sweeping at the edge of the cliffs ; this very rare British species I once found at Hurst, Sussex, and again, subsequently, at Caterham. *Rhyparochromus sabulicola* : sparingly, in short moss, in a sandy place. *Miridius quadrivirgatus* : sweeping along the cliffs, rarely. *Teratocoris antennatus* : both sexes, rarely, by sweeping *Arundo*, *Carex*, *Juncus*, &c., in a partially dried up piece of marsh ground. *Nabis lineatus* : not uncommonly, with the preceding. *Cardiastethus testaceus* : a single example, by evening sweeping at the edge of the cliffs.—G. C. CHAMPION, 11, Caldervale Road, Clapham : September 28th, 1886.

Pachytulus migratorius, Linné, in Lincolnshire.—Yesterday I received for identification a living female *P. migratorius*, L., from Mr. H. Wallis Kew, of Louth, Lincolnshire, who asks me to record its capture. It was said to have been taken in a field of stubble at Withern, eight miles from Louth, and was brought by a little girl to the local taxidermist, from whom Mr. Wallis Kew obtained it.—ELAND SHAW, St. Mary's Hospital, W. : Oct. 16th, 1886.

On the moult of the larvae of Pygæra bucephala.—I have lately had an opportunity of seeing a batch of these larvae undergoing their last moult, and was much struck with the prolonged interval which elapsed between their being laid up for the moult and the actual transformation taking place.

It was on Thursday, September 16th, that I first noticed the larvae ; they were then taking up their position on an oak-twigs, which was most conveniently situated, as it was just the right height for the eye, and it was in a place that I habitually passed a dozen times a day.

On the Friday, September 17th, the larvae were all fixed in position, and I could see by the amount of silken carpet spread over the leaves that moult was intended. They remained in this state all Saturday, all Sunday, and all Monday, except that on the Monday one solitary individual banged its head about from side to side, which I thought was a hopeful symptom. On Tuesday morning I must confess I was somewhat surprised that not a single larva had yet moulted, though they had begun to take up their position the previous Thursday, and, of course, had not tasted food since then.

Shortly after noon on Tuesday, the first moult took place, the newly-moulted larva was at once conspicuous by its pale yellow head, all the unmoulted larvae had black heads, and the anterior legs were even paler than the new heads. The mandibles were jet black directly, and contrasted very strongly with the pale yellow heads.

Returning in half an hour, I found that two more had moulted, and I stayed persistently watching them for some time, in hopes I should see the actual commencement of a moult. Such things never will happen whilst you are watching for them ; though I think I remained there motionless for three-quarters of an hour, no fresh moult occurred. My contemplative position appeared, however, to have attracted the attention of a robin, and he came and perched within two feet of me and eyed me very keenly.

At 1.30 p.m., I was obliged to leave my larvae for a while, but in little more than half an hour I returned to them, but, alas ! that wicked robin had — ; at any rate, the three newly moulted larvae had all disappeared, and a few of the others.

It may not have been the robin, it may have been some other bird, but, at any rate, I would not trust any longer to the chapter of accidents, so I cut off the oak-twigs and brought it and the larvæ indoors. Having placed the oak-twigs in water on the table, and having about twenty larvæ yet to moult, I thought I should surely in some of them see the actual commencement of the operation—but this expectation was doomed to be disappointed.

The new pale yellow head, which usually appeared above and behind the old black head, was always visible when I first glanced at a moulted larva, however little the moulted might have otherwise advanced, but the gradual retirement of the old skin towards the tail of the larva seemed to be almost a self-acting motion, to which the larva contributed but little till the time came for extricating its anal extremity from the old skin. The anal plate, like the head, was at first of a pale yellow, but the colour of this plate, as well as of the head, got gradually darker, till eventually both were jet black, yet the black markings all along the intervening segments were black the moment the old skin withdrew from them; in this, resembling the mandibles which, as already noted, were black on their first appearance.

The black faces of the moulted larvæ were ornamented with a central yellow mark like an inverted Y; the faces of the unmoulted larvæ were entirely black, without any yellow mark. The anterior-legs, which were so pale on their first appearance, also became eventually perfectly black.

In one instance the yellow head of the moulted larva appeared beneath the old head, but in all the other cases the rupture of the skin must have been on the back immediately behind the old head. The old heads were completely detached from the other parts of the skin, and fell down separately from the oak-twigs as the moultings progressed, so that by the prostrate heads on the table I could readily count how many larvæ had already moulted.

By Wednesday morning all but one or two of the batch had moulted, but not one had yet broken its long fast: it was not till Wednesday afternoon that feeding began. On Thursday, all the jaws were vigorously at work, and an oak-leaf was soon reduced to its mid-rib. I then turned the larvæ loose on a growing tree. From the very crowded position taken up by gregarious larvæ, moulted at times seemed to take place under difficulties, and one of the first larvæ that I observed had two other larvæ lying straight across its back at the very time that the old skin was being shuffled downwards.

I thought again and again of my first visit to Naples, where I met a German physician who had long been settled there, who assured us it was not at all unusual for the Neapolitans to sleep eight or ten in a bed.—H. T. STANTON, Mountsfield, Lewisham: *September 24th, 1886.*

Asthenes luteata.—With reference to Mr. Barrett's note respecting this species (Ent. Mo. Mag., vol. xxiii, p. 109), I may state that in a small well-wooded valley near here it occurs regularly, and we always obtain it by beating alder (*Alnus glutinosa*), and in company with *Eupisteria separata*. There is no maple (*Acer campestre*) in the vicinity, and I was always under the impression that it was a well-known fact that alder was the natural food of *A. luteata*, at least in the north of England.—J. W. CARTER, Valley Street, Bradford: *October 7th, 1886.*

External parasites on Lepidopterous larvæ.—At page 115 of the October number of the Ent. Mo. Mag., in the report of the September meeting of the Entomological Society, is a notice of certain *Acaris* found on a larva of *Sm. tiliae*, and believed to be *Uropoda vegetans*.

I wish to mention two *apparent* cases of larvæ similarly infested, which have occurred to me this season. On 26th June, Mr. G. T. Porritt sent me two full-grown larvæ of *L. quercifolia*, taken at Wicken Fen; one of these I put without food in a chip-box, and on shaking it out on a piece of paper I noticed that there fell with it a bright red, *very long-legged* mite, which ran with great swiftness; I secured it, and sent it to Mr. F. Enock, but it was dried up on the journey. On September 16th, Mr. W. H. B. Fletcher sent me some larvæ of *Cilix spinula*, on one of which—a sickly one—I found a small, almost colourless, mite; this I also sent to Mr. F. Enock, but it too was spoilt for his purposes by the journey. I wish to speak of these mites with caution, but I believe they were parasitic on the larvæ.

—J. HELLINS, Exeter: October 7th, 1886.

Erroneous record of Dichrorampha distinctana in Britain.—Mr. South has been good enough to send for my inspection a series of the *Dichrorampha* reared by him from *Chrysanthemum leucanthemum*, from the locality in which he took the specimens which I described as *distinctana*, Hein., in Ent. Mo. Mag., vol. xviii, p. 278, and I find that they are, as he says, genuine well-marked *consortana*. He also, at my request, forwarded one of the original specimens taken in 1881, and although this specimen differs in having the black longitudinal streaks very much less marked, I am now convinced that it also is simply our common *consortana*. It is, however, a brightly-marked specimen, as far as the paler and silvery markings are concerned, and bears a *very close* resemblance to German specimens of *distinctana*, but I see that there are slight distinctions, which, if constant, will always serve to separate the species. They are of almost precisely the same size and shape, except that the apex of the fore-wings in *distinctana* is rather more squared; its dorsal pale blotch is broader at the apex, and more strongly divided, each division being again divided by a black line, and the costal streaks are *single*, and developed into sinuous metallic lines, two of which compose the bright waved margins of the ocellus, and are outlined with black. If these characters are constant, they seem sufficient to enable us to discriminate the two species. The habits of *distinctana* in the larva-state are not, I think, recorded.—CHAS. G. BARRETT, King's Lynn: October 16th, 1886.

Choragus Sheppardi, Kirby, at King's Lynn.—While collecting with Mr. Theodore Wood in August, in a copse near this place, I found three specimens of *Choragus Sheppardi* on a dead or dying tree: the insect was not under the bark, but sitting on a portion of the trunk from which the bark had been removed; Mr. Wood subsequently took several specimens in the same place. The beetle appears to be usually found low down on the tree, and hops away quickly if disturbed; it may very probably be commoner than it is usually supposed to be, as it is a very inconspicuous insect, and from its habits may very easily be overlooked.—W. W. FOWLER, Lincoln: October 12th, 1886.

Aphodius lividus, Ol., near Broadstairs.—I am just now taking this insect in

fair abundance from a manure-heap in this neighbourhood. The heap in question is covered with a layer of sand, and the beetle usually occurs buried an inch or two beneath the surface. I have taken most of my specimens by shaking tufts of grass, &c., growing upon the heap, after tearing them up by the roots. The beetle is not an easy one to find, as it feigns death when disturbed, and is almost undistinguishable from the *débris* among which it lies. *Xantholinus fulgidus* is plentiful in the same heap. From decaying stumps in a copse close by, I have taken six examples of the active little *Choragus Sheppardi*; *Staphylinus stercorarius* has been fairly common upon the shore.—THEODORE WOOD, St. Peter's, Kent: *October 2nd, 1886.*

THE SOUTH LONDON ENTOMOLOGICAL AND NATURAL HISTORY SOCIETY,
September 16th, 1886: R. ADKIN, Esq., F.E.S., President, in the Chair.

Mr. Cooper exhibited a series of *Triphana fimbria*, L., bred from North Devon pupæ; and a series of *Zygaea filipendulae*, L., showing marked variations of the border of the posterior-wings. Mr. Adkin, *Lophopteryx cuculla*, Esp. Mr. E. Joy, a remarkable variety of *Episephela Janira*, L. Mr. Wellman, a series of *Acidalia bisetata*, Hufn., from Folkestone; a varied series of *Bryophila muralis*, Forst., from southern localities, also *B. par*, Hb., for comparison, and also *Dianthaea virgularis*, Hufn. Mr. W. G. Sheldon, *Agrotis agathina*, Dup.; some discussion ensued as to rearing the larvæ of this latter. Mr. J. Jenner Weir, a specimen of an *Agrotis* taken some forty years since, which has not yet been identified. Mr. West (Greenwich), a long and variable series of *Cryptocephalus pusillus*, F., from West Wickham.

It was announced that as the Society's Rooms had proved quite inadequate on the last occasion, the usual Annual Exhibition of Specimens of Natural History would take place at the "Bridge House Hotel" on Thursday, the 25th Nov. next.—H. W. BARKER and W. A. PEARCE, *Hon. Secs.*

ENTOMOLOGICAL SOCIETY OF LONDON: *October 6th, 1886.* — ROBERT McLACHLAN, Esq., F.R.S., President, in the Chair.

Mr. W. Bartlett Calvert, of Santiago, Chili, was elected a Fellow.

Mr. McLachlan exhibited a number of seeds of a Mexican species of *Euphorbiaceæ*, popularly known as "jumping seeds," recently received from the Royal Horticultural Society. These seeds are known to be infested with the larvæ of a species of *Tortricidæ*, allied to the apple *Tortrix*; they were first noticed by Prof. Westwood at a meeting of the Society held on the 7th June, 1858, and the moths bred therefrom were described by him as *Carpocapsa saltitans* (*cf.* Proc. Ent. Soc., 2nd series, vol. v, page 27). They have since been referred to both in Europe and America. A discussion ensued in which Mr. Pascoe, Mr. Poulton, Mr. Roland Trimen and others took part.

Mr. Roland Trimen exhibited and read notes on some singular objects found in the nests of *Termitæ*, and also in those of true ants, in South Africa. They were apparently of the same nature as those from the West Indies described

in 1833 by the Rev. L. Guilding as *Margarodes formicarius*, which was usually referred to the *Coccidae* as allied to *Porphyrophora*. They were of various shades from yellowish pearly to golden and copper colour, and were strung together by the natives like beads, and used by them as necklaces and other personal ornaments, as, according to Mr. Guilding, was the case with the West Indian species.

Mr. W. F. Kirby exhibited, on behalf of Mr. John Thorpe, of Middleton, a long series of buff and melanic varieties of *Amphidasis betularia*, and read notes on them communicated by Mr. Thorpe; also, on behalf of Mr. Nunney, who was present as a visitor, a dark variety of *Argynnis Aglaia* from Caithness, and a tawny-coloured variety of *Vanessa urticae* from Bournemouth. Mons. Alfred Wailly exhibited a fine series of *Saturniae* and other *Bombyces*, mostly bred by him, from South Africa; he also exhibited ova of *Saturnia tyrrheea*, pupæ of this and other South African species, and a cocoon of *Bombyx Ochadama* from Madagascar. He stated that several of the large south African *Saturnidae* formed no cocoons, the larvæ entering the earth to undergo the change to the pupal state. Mr. Trimen said he was able to confirm the statement.

Mr. Poulton gave an account of the experiments recently made by him with the larvæ of several species of the genus *Vanessa*, for the purpose of ascertaining the relations of pupal colour to that of the surface on which the larval skin is thrown off, which had formed the subject of a paper lately read by him before the British Association, and exhibited the frame constructed by him for the purpose of these experiments. The President and Messrs. Trimen, Waterhouse, White, Hall and others took part in the discussion which ensued.

Mr. Slater exhibited a specimen of *Prionus coriarius* from Devonshire, and a specimen of *Calandra palmarum* found alive at Pembroke Dock. Mr. Enock exhibited *Mymar pulchellus*, and a specimen of *Atypus piceus* recently taken on Hampstead Heath. Mr. Elisha exhibited a series of *Gelechia hippophaëlla*, Sch., bred from larvæ collected at Deal. Mr. Billups exhibited *Echthrus lancifer*, Gr., a species of *Ichneumonidae* new to Britain, taken at Walmer on the 15th August last. He remarked that Brischke had bred members of this genus from *Sesia spheciiformis*, *S. formicæformis*, and *Leucania obsoleta*; but in this country the genus was little known, only one species (*Echthrus reluctator*) being mentioned in Marshall's list of British *Ichneumonidae*. Mr. E. A. Butler exhibited a male and female of *Macrocoleus tanaceti* from Bramley, near Guildford; living specimens of *Chilacis typhae*, received from the Rev. E. N. Bloomfield, of Guestling, Hastings; and a pair of *Harpalus discoideus*, obtained in August last on a heath near Chilworth, Surrey. Mr. A. J. Rose exhibited a mountain form of *Lycæna virgaurea*, recently collected by him in Norway. Mr. Champion exhibited *Teratocoris antennatus* and *Drymus pilicornis*, taken near Sheerness. Mr. W. White exhibited specimens of *Proctotrypes ater*, Nees; also a specimen of *Chelonia Caja* with abnormal antennæ, and read notes on the subject.

Mr. Elisha read a paper "On the life-history of *Geometra smaragdaria*."

Mr. C. O. Waterhouse communicated a paper "On the Tea-bugs of India and Java."

During the meeting a telegram was received from Mr. Freeman, of Plymouth, announcing the recent capture, in Cornwall, of *Anosia Plexippus*.—H. Goss, *Secretary.*

OCCURRENCE OF *BOTYS REPANDALIS*, SCHIFF., IN BRITAIN.

BY C. G. BARRETT, F.E.S.

The Rev. Henry Burney has forwarded to me for examination specimens of a pretty little yellow *Pyralis* reared by him some years ago, but which he had set aside under the impression that they belonged to a common species. I find they are certainly *Botys repandalis*, Schiff., agreeing accurately with specimens sent me by the late Prof. Zeller. Mr. Burney tells me that he found the larvæ in June feeding in the heads and young shoots of *Verbascum nigrum* on the south coast of Devon. They were yellowish-white with black spots, and fed on the young leaves, eating down into the shoots, but left the plant when full-grown, and assumed the pupa state among the débris at the bottom of the breeding cage, the moths emerging in the following month. This pretty species has not, I believe, hitherto been recorded in this country, but is not uncommon in central and southern Europe. It is very closely allied to *hyalinalis* and *pandalis*, but of a paler yellow, and decidedly smaller than either, being of about the size of *verbascalis*, but with narrower fore-wings. The fore-wings are of a delicate pale straw-colour, and the markings, which closely resemble those of *hyalinalis*, are of a faint yellowish-grey. The first line is comparatively straight, the second also straight from the middle of the dorsal margin to the middle of the wing, where it touches the discal streak or stigma, then turns abruptly towards the hind margin and makes a wide sweep before turning again towards the costa; the third is parallel with the hind margin. These three lines are continued upon the silky whitish hind-wings.

Dr. E. Hofmann describes the larva:—

“Thick, tapering anteriorly, yellow-white, with many single hair-bearing raised dots. Head honey-yellow, dorsal plate of the colour of the body, studded with warts. From March until May, and in July, in the leaves of *Verbascum* in a felted mixture of fragments of the plant. Assuming the pupa state in a red-brown cocoon. Imago in June and August; widely distributed.”

Treitschke says (under the name of *pallidella*):

“The larvæ live gregariously from March to May, and the next brood in July, among the leaves of *Verbascum thapsus* and *thapooides*, in a mixture of silk and the down of the plant, or in the flower shoots in a little passage eaten down into the stem. They are yellow, with black dots. Pupa yellow.”

This species is a welcome and extremely interesting addition to the British fauna.

King's Lynn, Norfolk:

November 13th, 1886.

NOTES ON SOME SPRING-FREQUENTING TRICHOPTERA.

BY KENNETH J. MORTON.

In one of our glens there is a corner which is well known to some of my Neuropterological friends as one of the few British localities where *Drepanopteryx phalaenoides* has been found, and as the only known one for *Adicella filicornis*. To those who do not know it, let me explain that this corner lies in a deep gorge with steep, well-wooded sides, and that its situation is perfect as far as protection from cold winds is concerned. From the sides of the glen here, many trickling springs arise, and the water from them, after streaming over moss-grown rock-faces at some points, finds its way into the river by various channels which run through a patch covered with a luxuriant vegetation. Quite a number of the spring-frequenting *Trichoptera* haunt this spot, and during the summer *Crunæcia irrorata*, *Beraea pullata*, *Adicella filicornis*, and *Diplectrona felix* may all be found together. Having paid some attention to these little caddis-flies I propose to give some account of the habits and cases of the three first-named, which I have reared.

CRUNÆCIA IRRORATA, Curt.

On the wet rock-walls, amongst the moss which in some places covers them, and in the small channels which draw off the water to the river, may be found cases from 6 to 8 mm. in length, made of small square plates, cut out of fresh or dead leaves or moss, sometimes mixed with fibres placed transversely. The plates and fibres are neatly cemented together, so as to form perfectly quadrangular cases. As already recorded (vol. xxii, p. 43), these cases are the work of the larvæ of *C. irrorata*.

But the cases of *C. irrorata* are not always quadrangular: very junior larvæ inhabit cases which are almost perfect cones made of sand grains, rather rough externally; and examples may often be found in a transition state—mouth-end quadrate, made of vegetable matter; tail-end consisting of the sand-cone with the apex cut off. There is before me one taken from a rock-spring the other day, and of a length of 8 mm.: 5½ mm. is composed of vegetable matter, arranged in the usual way, while the rest is made of sand. In another the proportions are just about reversed. So, while the gradual change appears to be usual, it is possible that under certain conditions the sand-case is persistent, simply increasing in size, and becoming less attenuated towards the tail-end—a conjecture which applies equally

to *L. hirtum*, another quadrangular-case maker, but not to *B. subnubilus*. The case of *B. subnubilus* is one of the most remarkable we have, and it differs much in texture from those of the other two species.

The larva of *C. irrorata* is white, with a greenish or yellowish tint. Head, a rounded-oval, with some isolated hairs, uniform dark brown. Pronotum transverse, as wide as head, short, anterior edge straight, posterior rounded; a few isolated hairs on the disc, and a fringe of long stiff hairs on the anterior margin, which hairs are directed forwards, and slightly upwards; dark brown. Mesonotum transverse, broader than pronotum, and paler in colour, especially on its posterior part; a few scattered hairs; side-pieces, to which legs are attached, darkly marked. Metathorax short, transverse, broader than preceding segments; a few hairs arising from warts; side-pieces as in mesothorax. The legs are yellowish, with long hairs; first pair short; other two pairs rather long and subequal. The abdomen is nearly parallel on the sides; along the lateral lines runs a fringe of very fine hairs; respiratory filaments isolated, and not very numerous, of moderate length; the last segment is narrower than the rest, and the crochets are brown, and bear some long and very strong black hairs. There are lateral processes on the first abdominal segment, but I cannot make out their true form; when protruded they show a delicate fringe.

It is now known that quadrangular cases of three kinds exist in Britain, belonging, as indicated above, to *Brachycentrus subnubilus*, *Lepidostoma hirtum*, and the subject of the present notice. Later I hope to say something about *L. hirtum*; the history of *B. subnubilus* has been written so well already that it hardly requires supplement (McLach., Ent. Mo. Mag., vol. x, p. 257).

Hagen appears to have been the first to notice this form of caddis-case, and in the Stett. ent. Zeit., 1864, p. 113, he refers to what he considers three kinds. Probably his No. 2 belongs to *B. subnubilus*, and No. 3 to *L. hirtum*, or an ally. No. 1 is altogether remarkable. It was received from Bremi, who states that he found it amongst moss far from water, and, certainly, the size given, and other points in the description, suggest *Crunæcia*. The larvæ of this insect are not so absolutely aquatic in habit as those of many species; they can, no doubt, stand total submersion in shallow water, but they crawl about quite freely as long as there is moisture present at all, and in captivity spin up on damp stones, or on the sides of glasses just touching the water. *Enoicyla* is the only known Trichopterous genus presenting truly terrestrial habits during larval life, and Bremi's declaration is not yet to be explained, unless it is assumed that some unseen driblet existed, which gave the essential, if little, moisture.*

* Compare de Rougemont (Bull. Soc. Sci. Nat. Neuchâtel, xi, 405—426) and McLachlan (Mon. Rev. Europ. Trich., 1st add. suppl., p. 80), on *Helicopsyche*. *Adictella* *sticornis* in its early stages appears to prefer simple humidity to total submersion; so, too, probably, do all species frequenting such places as *C. irrorata* affects. A small larva, which I take to be that of a *Wormaldia*, but which I have not yet been able to rear, succumbs very soon if placed in water of any depth.

In the Stett. ent. Zeit., 1867, p. 59, McLachlan describes cases made out of fragments of fern roots, which are no doubt those of *C. irrorata*. As a matter of fact, he bred that insect from the moss containing them; but since there were two other forms of case present it was not possible to say conclusively from which it emerged.

It is uncertain whether Pictet's figures of the larva and case of his *Sericostoma hirtum* (Recherches, pl. xiv, fig. 3) refer to *C. irrorata*. The case is represented as a sand-grain one, but that would not be an objection if, as I suspect, such cases, normally peculiar to young larvæ, are sometimes permanent.

It would be interesting to know if any other genus of the *Sericostomatidae* (or, less probably, of any other family) has cases of the quadrangular type. The only other British species which might have been suspected is *Lasiocephala basalis*, but Meyer says it makes a sand one. *Oligoplectrum* has also a slender case of sand. *Micrasema* remains; the habits, which are quite unknown, might easily receive elucidation at the hands of the continental entomologists.

Berea pullata, Curt.

The habits of the genus *Berea*, as regards the perfect insects, are well known. These small black caddis-flies are to be found usually in abundance about shallow streams where reeds, *Caltha palustris*, and other water-weeds grow in such profusion that often in summer no water is to be seen at all. In such places the larvæ of *B. pullata* are to be found, and they also occur in the channels alluded to at the beginning of these notes.

The rank character of the vegetation, and the great quantity of vegetable débris which usually covers the beds of the streams *Berea* delights in, render the search for the small cases very difficult. The best way to obtain them is to take from the bottom hauls of mud, &c., which are put into a bag, and, after washing away the loose sand in some convenient burn, by examining what remains one or two may be found. This operation can be conducted best in the early spring, when there is less vegetation to contend with.

There is only one full-sized case before me; it is about 10 mm. long, composed of sand-grains, is strongly curved, and tapers greatly to the tail end; the mouth-end is closed by the usual button-like operculum, in which there is an excentric slit. The colour is blackish. This case, from which the perfect insect was reared, was buried for about two-thirds of its length in sand; but no doubt the larvæ usually spin up about the roots of water plants, as in *Beraodes*. After most

exhausting efforts, this larva got hoisted to the top of an enormous stone (in proportion to the creature's size), which was fixed not so as to close the case, but at the side evidently to serve as a *point d'appui* when the operculum came to be forced by the nymph. The fixing of the case took place on May 20th, and the perfect insect appeared June 7th.

The larva is of a distinctly Leptoceridous type, from the great development of the posterior legs. The head is almost round; the prothorax transverse, with the sides produced anteriorly into a tooth: these two segments are of a bright reddish colour, while the rest of the body is white, or, in older examples, yellowish. The body is rather slender, and tapers gradually to the anal extremity; a slight fringe on the penultimate segment; crochets with bunches of hairs, and above them small protuberances, bearing one or two bristles of great length, and a few shorter hairs; no external respiratory filaments. The legs are rather thickly clothed with long silky hairs.

ADICELLA FILICORNIS, Pict.

The habits of this pretty little species were known to Pictet, and he has described and figured the larva and case in "Recherches" (p. 171, pl. xii, fig. 6).

I made the acquaintance of the perfect insect in June, 1884, and on April 8th of the present year found the cases in small cavities, where there was a constant trickle of water, and which were covered with a facing of moss. The moss was, of course, moist, and on its inner face the cases were fixed. They mostly contained nymphs. Only two were found containing larvæ, and I am not sure now whether they came from the mossy roof, or from the floor over which the water streamed; they soon spun up, and the first insect came out on May 16th.

The cases are 8 to 10 mm. in length, strongly curved and tapering, composed of sand-grains on an inner tube of silk. They are usually of a russet colour, but some are blackish in the older parts, as is usual in cases of this form. They seem to be covered with a deposit of some kind, which gives them a comparatively smooth appearance.

The shape of the case of *B. pullata*, the long legs and reddish head of its larva, led me to suspect at first that Pictet had erred in his identification of the larva of his *Mystacides filicornis*. There is a superficial resemblance between the two in the points mentioned, but the more elongate head and uncoloured prothorax of the larva of *A. filicornis* are good differential characters, not to speak of its antennæ, which are developed to such a degree that they are distinctly indicated in Pictet's figure, though he makes no reference to them in the text.

This insect's long antennæ are curiously disposed of while the nymph is still enclosed in the case. They are neatly wound in a double spiral round the posterior part of the abdomen. Possibly all the long-horned *Leptoceridae* have theirs rolled up in the like manner.

It appears to me that *Diplectrona felix* also breeds within my limits, but its larva has hitherto escaped detection. Those caseless larvæ are more difficult to find, and more difficult to rear than case-bearing ones.

It is not to be thought that these four species exhaust the list of spring-frequenting *Trichoptera* of even this neighbourhood. I believe, however, they represent the complete Trichopterous fauna of the spring I have had especially in view when writing these notes.

Carluke, N.B.
October, 1886.

NOTE ON SOME BRITISH COCCIDÆ (No. 5).

BY J. W. DOUGLAS, F.E.S.

ASPIDIOTUS ZONATUS.

Aspidiotus zonatus, Frauenf., Verhandl. z.-b. Gesells. Wien, 1868, p. 888. Sign., Ess. Cochin., p. 109.

Aspidiotus quercus, Sign., Ess. Cochin., p. 106.

♂. Scale flat, long-oval, sides somewhat parallel, ends broadly rounded, dingy whitish, the exuvia darker or yellowish, oval, slightly raised, situated towards one end, usually not reaching the sides, of which the margin is in the least degree recurved. The length varies from 1·45 down to 1·075 mm.

♀. Scale whitish, rounded, diam. .50 mm. or less, the insect without abdominal agglomerated spinnerets, according to Signoret.

♂ imago lemon-yellow, wings white.

On the 27th September last, near here, I found common, close to the ribs on the under-side of the young terminal leaves of short, lateral shoots of a stunted, weather-beaten oak (*Quercus robur*), growing in a very exposed situation, the scales of an *Aspidiotus*; and on referring to Signoret's translated description of Frauenfeld's *A. zonatus* (*l. c.*), an oak feeder, it was seen that these agreed therewith, except as to the length and colour, the former being given as "d'un huitième de millimètre," and the latter as "blanchâtre, avec une zone entourant la côte." Turning then to Frauenfeld's original description (*l. c.*), which is illustrated by a figure, I saw that the length is given as 1·8 mm. (.8 mm. being evidently an error of the translator), and this, though in excess of that of my example, is much more approximate; still the discrepancy as to the colour remained.

The description of the ♂ scale of *Aspidiotus quercus*, Sign. (l. c.), found on oaks, accords with my examples, but the dimension is not given ; it is only said "Cette espèce nous paraît distincte de *zonatus*, Frauenfeld."

To elucidate the matter, I sent some leaves with ♂ scales attached to Dr. Signoret, and he, with his usual courtesy, at once replied : "Les échantillons sur chêne sont l'*Aspidiotus zonatus*, Frauenf., = *Asp. quercus*, Sign. Je n'avais pu reconnaître d'abord cette espèce à cause des différences de couleurs, mais l'ayant reçue de Vienne je n'ai plus aucun doute à cet égard." I may surmise that, as in other species of *Aspidiotus*, the colour changes with the age of the scale ; the length evidently varies.

The scales I examined were empty, no doubt due to the previous exit of the ♂, the time for its appearance, as stated by Frauenfeld, being the end of August or beginning of September ; but Mr. G. S. Saunders, to whom I sent some scales, was fortunate enough to obtain two males, one of which was alive.

In comparison with the number of ♂ scales, of which there were sometimes as many as 30 on one leaf, those of the ♀ were scarce. They are small and rounded, but I suspect would grow much after the fecundation of the ♀, and that the eggs would not hatch until next year, so that there may possibly be a summer brood. Signoret found ♂ scales on the trunk as well as on the leaves ; this I failed to do, but without there are ♀ scales and eggs also deposited on the branches it is difficult to comprehend how the race is carried on, as the leaves are all fallen by the end of October and perish during the winter. The ♂ scale is remarkable for its form and great size, as well as for its being larger than that of the ♀, the converse of the latter being the rule. In the spring of 1885 Mr. Saunders found on oak leaves of the previous year, at Frant Wood, a few scales, which were probably of this species, but being shrunk and empty, nothing could be made of them. Frauenfeld first discovered the scales of his *A. zonatus* (but only the ♂) extremely abundant on the leaves of *Quercus montana*, Willd., an American oak growing in the Botanic Garden at Vienna, and it is therefore curious that this *Aspidiotus* is not enumerated by Comstock among the American species known to him. It is new to the British list.

ASPIDIOTUS NERII, Bouché.

Scales flat, white or yellowish-white ; ♀ when adult 2 mm. in diameter, circular, when immature with a more irregular outline ; the larval exuviae nearly central, yellowish : ♂ smaller, elongate, oval. ♂ imago yellow, dotted with orange-brown, I have not seen.

In February Mr. G. S. Saunders found ♀ scales on *Aucuba* and a *Dracæna* under glass at Canterbury, and in July I found both sexes abundant, but mostly immature, on the under-side of the young leaves of a greenhouse *Azalea*: all these on examination exhibit the spinnerets and abdominal appendages of *A. nerii*, as described and figured by Signoret and Comstock. This species, which is in Walker's British List, is the commonest of the genus, and lives not only on the oleander but a great variety of plants, and in the south of Europe and the United States of America flourishes in the open air.

MYTILASPIS ULCIS, Doug.

Under this name I previously recorded provisionally (vol. xxii, p. 249) a *Mytilaspis* living on the spines of furze, and in addition to what was then stated as to the habitat, form and position of the scales, I have now to state that they are shining and not dull brown, and do not become black by age as in *M. pomorum*; that the margin is distinctly dentate at intervals; and the ventral pellicle regularly pitted all over with small circular depressions remains entire, and is not separated up the middle. The spinnerets and abdominal fringe, as in some other species of the genus, are very like those of *M. pomorum*, yet with a difference, not difficult to see, but not otherwise to be apprehended. Taking into consideration all the circumstances pertaining to this form, I certainly believe it to be a distinct species that can easily be recognised by any captor.

PSEUDOCOCCUS FAGI, Baerensp.

At the end of May last, at Blackheath, I saw on the trunk of a beech tree, some 40 or 50 years old, many white spots of flocculent matter protruding through small cracks in the dry, black bark, forming mostly isolated, short, stout tufts or streaks, but sometimes several of them were close together, making conspicuous patches. I cut out some of the bark so affected, and found that the flocy matter extended under the free edges of the cracks as it were into the dead or dry bark, and there were in each instance from four to eight fat, yellow, oval Coccids lying close together, but each separately in a kind of cell formed in the compact felt-like cottony flocks.

On the 16th July I again visited the tree and cut out several of the white patches, and found in each 8—12 pale yellow Coccids closely packed together in the felt-like cotton, and surrounded with eggs. Under the microscope I saw the Coccids were just mature.

They were of sulphur-yellow colour; in form a short rounded-oval, barely half a line long, nearly circular, very convex both above and below, and therefore almost

globose, clothed above with the finest possible pubescence, but without any projections at the sides or end, except some pale setaceous hairs on the latter. Viewed from beneath, on the anterior margin of the head were two blackish angulated eyes, rounded in front, extending obliquely inward and downward to a long, fine point: a short, appressed, covered rostrum, of which the brown tubular end was free and turned at a right angle, and from this end projected an extremely fine blackish seta, three times the length of the body, which waved about like a grass stem in the wind. Antennæ short, thick, apparently of three joints only. Legs short, but being embedded in the fat body, and like the antennæ concolorous, difficult to see. All the segments of the body determinable, the junction along the sides of the upper and lower half-rings of the abdomen forms a continuous thickening there. I saw in several instances the actual extrusion of eggs, large, pale yellow, oval, transparent, filled, apparently, with fluid, in which, in a day or two, faint granulation appeared; seven or eight of the eggs seem to have been laid by one mother; their size was very large in comparison with the maternal body, but this shrivelled after their exclusion. I saw no trace of a male, and that sex appears to be unknown.

In August Mr. Parfitt found some of these Coccoids on beech trees at Exeter.

Turning to Signoret's "Essai sur les Cochinelles," I find that the author knew only by description a *Coccus fagi*, which he attributes to Hardy, and first cites as a *Pulvinaria*? (p. 212); then (at p. 453) he says it is wrongly placed thus, and gives it as *Coccus fagi*, Walker (List of Homopterous Insects in the Collection of the British Museum, part iv, p. 1086, 1852), saying, "Voici la description insignifiante qu'en donne l'auteur: "*Flava, elliptica, albo farinosa*; length, 2 lines." Cette description convient à tous les *Dactylopius*, *Pseudococcus* et *Coccus*:" Signoret also adds, "We think this species may only be that of Baerensprung, and should probably be placed in our series of *Pseudococcus*."

Having referred to Mr. Hardy for any information he could give respecting this species, he very kindly sent the following communication, dated June 14th, 1886:

" You have assuredly found *Coccus fagi*. I first gave an account of it, from Dalkeith Park, in the 'North British Agriculturist and Journal of Horticulture,' 1849 or 1850. I did not describe it, but mentioned it as *Coccus fagi* of Walker, who told me he had found it in some of the London Parks. The last notice I gave was in the 'Berwickshire Naturalists' Club Proceedings,' vol. x, pp. 607-8; I transcribe it:—

" 'Coccus fagi' in the Ravensworth Woods. When walking in the end of August, 1884, with the Rev. R. H. Williamson, in the woods near Wheeckham Washing-well Dean, belonging to the Earl of Ravensworth, I observed that several of the trunks of some old beeches were spotted white with the cottony investment of *Coccus fagi*, which is not recorded in any of the lists of the insects of Northumberland and Durham. It was a place I knew, for I had been there entomologizing more than thirty years previously. On November 5th, 1888, I noticed that it still exists in Dalkeith Park, and as I have noticed before (vol. x, p. 263) it occurs in

Gosford Park (Earl of Wemys, East Lothian), and near Ayton (Berwickshire); still more recently I observed it on beech trunks and roots at Polton Bank (near Hawthornden, Midlothian), on both sides of the road to the railway station."

Following up Signoret's indication of Baerensprung's *Coccus fagi*, I find it described in D'Alton and Burmeister's "Zeitung für Zoologie, Zootomie und Palaeozoologie" (1849), vol. i, p. 174, thus:—

" *C. fagi*. ♀. *Lutea, ovata, abdominis apice hirsuta, capite minuto, antennis brevibus crassis.*

Long. 2 lin.

" On the beeches in the Berlin Thiergarten. The females, as in the foregoing species (*C. strobi*), are enveloped in a thick felt, which appears to proceed especially from the hinder part of the thick and soft sulphur-yellow insects. The antennæ are very short and thick, and near them the black eye-points (Augenpunkte). The short legs are almost entirely retracted into the plump body.

" In December I found on the same then leafless bushes the white felt packs, in which the females were no longer to be seen, but numerous eggs and larvae instead. The latter had all the same elliptic form, two red eye-points, and short, five-jointed antennæ, which had some setaceous hairs at the extremity. The last segment of the abdomen was furnished with two pairs of papillæ, the inner smaller than the outer, and some setaceous hairs between them.

" Among the larvae was a strongly-haired, sulphur-yellow Acarid."

I think it is clear from the foregoing that my insect is the *Coccus fagi* of Baerensprung, the only real difference in the descriptions being in the length of the body, which, as given by Baerensprung, is somewhat in excess of that I find. It is also sure that it is the same as that recorded by Hardy, and which Walker described under the name of *Coccus fagi*, Walk., doubtless unaware of Baerensprung's previous description under the same name: the length, "2 lines," is a palpable error.

The genus *Pseudococcus*, Sign., is not exactly the same as the original *Pseudococcus*, Westwood, founded on *Coccus adonidum*, *C. cacti*, &c.; but not to argue nor to put too fine a point on the matter, the genus, in either case, may be regarded as, like Mercutio's wound, not of strictly definite dimensions, and like it also—" 'tis enough, 'twill serve" —for this occasion.

DACTYLOPIUS DESTRUCTOR.

Dactylopius destructor, Comstock, Report for 1880 (1881), p. 342, pl. xi, fig. 3, ♀, pl. xxii, fig. 2, ♂.

♀. Adult oval, 3—4 mm. long, 2 mm. wide. Dull brownish-yellow, legs and antennæ concolorous. Surface of body, and the under-side also, but thinly covered with fine, white, granular, waxen secretion, so that the ground-colour shows through it faintly, the result being often a livid appearance. The marginal projecting appendages (17 on each side), white, short, in length sub-equal, except that in some examples two of the posterior ones are a mere trifle longer. Antennæ 8-jointed, 8th joint longest, 4th shortest; tarsi about half the length of the tibiae. Eggs yellow, laid in a cottony mass, which eventually covers the ♀. Young larvae yellow.

♂ rather less than 1 mm. in length, expanse of wings, 2.5 mm. Body slender, light olive-brown, legs concolorous. Wings grey-white; halteres small, slender, bent, hook-form. Antennæ reddish-yellow, 10-jointed, 3rd and 10th joints longest, sub-equal. Eyes and ocelli dark red. The two anal filaments long, white.

The ♀ of this species is at once distinguished by the shortness of the projecting filaments on the circumference, and the non-elongation of two posterior ones, as in other species.

On May 18th, in Mr. Stainton's forcing-pit, cucumber plants were infested with a *Dactylopius* to that extent that the leaves were in a state of collapse, each leaf having on its under-side a colony in all stages of life. Among the cottony web, which was plentiful, I found also, alongside the ribs of the leaf, some living males, which, however, were not active. On July 24th females of the same species abounded on cucumber plants in a frame on a hotbed, but there were no males. Of these females I took several, and having subjected them for a long time to the influence of the vapour of benzine, I deemed they were dead, and gummed them on to card, but the next day I was surprised to see that from each had been expelled a long string of cylindrical, yellow eggs, joined together at their truncate ends; looking again after some days I found that the eggs had disappeared, and that the larvae that had emerged had spread all over the small box that had contained the females, carrying with them a cottony web, and that the mothers had shrunk into shapeless masses.

In his "Essai sur les Cochenilles," Signoret enumerates 18 species of the genus *Dactylopius*, of which a prominent character is that the body of the ♀ has a series of projecting filamentous appendages on the circumference, variation in these and other structural characters, of more or less importance, being found to differentiate the respective species; yet it is a striking feature of the descriptions that each species is said generally to resemble one or another of them. There can, however, be no doubt as to the distinctness of that now in hand (which was not known to Signoret), by reason especially of the peculiar shortness and equality in length of the circumferential appendages, and also, I think, that as it fits so well the description, there is no question it is *destructor*, Comst. It is said to be very abundant upon almost every variety of plant in the department greenhouses (at Ithaca). The name *destructor* is, however, proposed for this insect from the damage done by it to orange trees in Florida, especially at Jacksonville and Micanopy, where it is the most serious insect-pest of the orange (*op. cit.*, p. 343). It is an addition to the British List.

LIST OF BRITISH *TIPULIDÆ*, &c. ("DADDY-LONGLEGS"),
WITH NOTES.

BY G. H. VERBALL, F.E.S.

(Continued from page 125).

DICRANOMYIA.

- 1 (4) Origin of radial vein considerably before end of mediastinal vein.
- 2 (3) Discal cell open, coalescing with second posterior cell, outer half of disc of wing nearly glabrous *aquosa*, n. sp.
- 3 (2) Discal cell closed (if = *D. pilipennis*, O.-S., and consequently discal cell sometimes open, it coalesces with third posterior cell), outer half of disc of wing pubescent *pilipennis*, Egg.
- 4 (1) Origin of radial vein nearly opposite end of mediastinal vein.
- 5 (6) Subcostal cross vein practically at the end of the mediastinal vein (frons silvery, wings spotted) *dumetorum*, Mg.
- 6 (5) Subcostal cross vein far before the end of the mediastinal vein.
- 7 (20) Wings either clear, or with a stigma only, or (*D. chorea*) with a dark stigma and the cross veins somewhat clouded.
- 8 (19) Thorax not shining black; frons and pleurae dull.
- 9 (10) Joints of the outer half or more of the antennæ elongate, and bearing bristles three times as long as each joint (basal joint and rostrum yellow) *modesta*, Mg.
- 10 (9) Joints of the antennæ not elongate; the bristles thereon only about as long as each joint.
- 11 (14) Distinctly ochreous species, even though there may be dark lines on the thorax (see also *D. chorea*), cross veins never infuscated, stigma faint or absent.
- 12 (13) Antennæ all blackish *mitis*, Mg.
- 13 (12) Antennæ yellowish at base *lutea*, Mg.
- 14 (11) Species not at all, or very little (*D. chorea*) ochreous.
- 15 (18) Stigma distinct.
- 16 (17) Pleurae somewhat ochreous, cross veins usually somewhat infuscated .. *chorea*, F.
- 17 (16) Pleurae not ochreous, cross veins not at all infuscated ... *stigmatica*, Mg.
- 18 (15) Stigma absent *sericata*, Mg.
- 19 (8) Thorax shining black, frons and pleurae silvery *morio*, F.
- 20 (7) Wings conspicuously spotted, at any rate three distinct spots near costa.
- 21 (22) Wings with only the three spots near costa conspicuous, mediastinal vein ending nearly opposite one-third the length of the prefuræ... *didyma*, Mg.
- 22 (21) Wings dotted along the postical vein, besides numerous other spots; mediastinal vein extended slightly beyond the origin of the prefuræ... *ornata*, Mg.

D. AQUOSA, n. sp. (♂ ♀).—*Minor*, nigro-brunnea subnitida; alis glabris immaculatis præter stigma infuscatum; vena mediastinali pone prefuræ initium extensa, cellula discoidali aperta.

Distinct from all European species by its open discal cell, and (except from *D. pilipennis*) from all British species by the origin of

the *præfurca* being considerably before the end of the mediastinal. The smallest British species, being slightly smaller than *D. morio*; brownish-black, somewhat shining, a pale line between dorsum and pleuræ, the whole disc of the abdomen with a lurid yellowish tint.

♂. Antennæ all black, basal joint shortish, joints of the flagellum oval, bearing bristles nearly three times as long as each joint; palpi black; rostrum shining blackish; frons and vertex blackish-brown, with grey reflections of tomentum. Halteræ brownish-black, yellow at base. Pleuræ with yellowish reflections and greyish tomentum. Genitalia dark yellowish-brown at the base, becoming nearly black at the end, the basal lamellæ simple externally, inside at end above is the usual hooked process on each, on which are two long diverging bristles, yellowish-brown at their base; outer lamellæ smallish, ending above in a strong curved spine; middle piece long, dark yellowish; sometimes it appears as if the end of the basal lamella, or the base of the outer lamella, had (when seen sideways) two curved spines above, and the outer lamella a long almost straight one below, hence it is evident that the hook at the end of the outer lamella originates near the base of the lamella and can be unfolded. Legs blackish, lurid at base, end of femora (especially front pair) rather thickened; coxæ and trochanters yellow. Wings smoky, extreme base yellow, stigma distinct, almost blackish to the naked eye; veins on the outer half of the wing pubescent, bearing rather long hairs. The mediastinal vein and its subcostal cross vein end in what looks like a short fork rather beyond the middle of the *præfurca*, the dark stigma is elongate-oval, at its end are the end of the subcostal vein and its marginal cross vein, both very faint, the cross vein is considerably the longer and bent downwards, making the end of the subcostal appear like a short cross vein to the costa; the marginal cross vein joins the upper branch of the radial at about one-third the length of the latter; the *præfurca* is more than half the length of the forks of the radial; all the veins near the tip of the wing curve down; the discal cell is always open and coalesces with the second posterior cell, making the discal vein forked; the bases of all the posterior cells are nearly level, the submarginal being only a little nearer the base of the wing; anal vein a little incurved at its end.

♀. Very similar to ♂, but the base of the legs a little paler; ovipositor reddish-yellow.

This species is evidently closely allied to *D. pilipennis*, Egger (= *L. turpis*, Wlk.), but is easily distinguished by its smaller size, open discal cell, and by the disc of the wing on its outer half not being pilose; it appears a little like *D. morio*, but is really very distinct; I find a *L. aperta*, Lw., next to *L. morio* in Verh. z.-b. Wien, xxiii, 27 (1873), but I cannot trace any description.

Common near the Falls of the Shin in Sutherlandshire, from July 11th to 17th this year, near the water on the damp sides of cliffs, and more sparingly at other similar places, also on the Ross-shire side of the Oykel.

D. pilipennis: Egger's description was published in Verh. z.-b. Digitized by Google

Wien, xiii, 1108 (1863), and Walker's *L. turpis* in Ins. Br. Dipt., iii, 300 (1856), but Walker described another *L. turpis* in Ins. Saund., 434 (1856); which of Walker's species has priority I do not know, the preface in Ins. Br. Dipt. being dated February, 1856, while that of Ins. Saund. is January 18th, 1856; under the doubt and carelessness I think both Walker's names had better cease. Prior to Egger's again is Osten-Sacken's description of *D. pubipennis*, Pr. Ac. Nat. Sc. Phil., 211 (1859), which I expect will prove to be the same species, but I dare not adopt the name of an American species without close comparison with European specimens; after all I think Meigen's *L. fusca*, Sys. Bes., I, 133, t. 4, f. 19 (1818), will prove to be this species, and then there can be no doubt as to priority of nomenclature; in the mean time Egger's name "holds the field." The species seems to be not very uncommon in the south of England, as I have taken it in Kent, Sussex, Hampshire and Devonshire during the last two years.

D. modesta, Mg.: this species may be known at once by its verticillate antennæ with elongate joints; I have not the least doubt that I have the species intended by Meigen (Sys. Bes., I, 134), and Zetterstedt (Dipt. Skan., x, 3863, where the antennæ are described in detail), but I am very doubtful about Schiner and others, by whom the species of *Dicranomyia* have been very insufficiently studied, and it is certainly not the species so called by Osten-Sacken (Stet. Ent. Zeit., xv, 211). They all require very close study of the male genitalia, and by help of these characters I believe at least two more British species will be distinguished, only the material at my disposal is unsatisfactory; however, apart from the genitalia, the antennæ will always distinguish *D. modesta* from any other species I am acquainted with. I catch it abundantly in August and September near Mildenhall and Exning in Suffolk, also in June in the New Forest, and late in August in extreme South Devon (Slapton).

D. chorea, Mg.: this is the commonest species of all the *Tipulidae* and *Limnobiadæ*, occurring in every garden or wood throughout Great Britain, and yet it is still to me a most unsatisfactory species; in its commonest and most typical form it has a distinct reniform stigma and infuscated cross veins, in which state it is easy to distinguish, but its markings fade off so much that specimens without the infuscated cross vein are very puzzling. I hope, by further examination of the male genitalia in a living state, to come to more definite conclusions. The allied species in Britain are what I call *D. stigmatica*, *lutea*, *mitis*, and one or two more; *stigmatica* I am not at all satisfied with; by it

I mean a slightly larger darker species than *chorea*, but with the wing markings consisting of a distinct stigma only; I have numerous females, but only one unsatisfactory male. I believe the *D. stigmatica* of the continent is a good distinct species, and I have no doubt it occurs here; my so-called specimens extend from the New Forest to Tongue, but are most abundant northwards. My *D. lutea* may always be known from *D. mitis* by the yellowish base of the antennæ, and the basal lamella of the male genitalia has a process beneath which is not present in *D. chorea*, it is common in Sussex and Hampshire; very close to this, only with very different genitalia, comes another yellowish species of which I possess no good specimens; then comes what I may consider *D. mitis*, Mg. (rather than give it a new name), it has the antennæ all blackish-brown, and the basal lamella of the genitalia with a long process beneath; it was common in the New Forest and at Lymington in June, 1885, but I have not met with it this year.

Under this group of species come Walker's *L. albifrons*, *globata*, *sera*, *inusta*, *disjuncta*, *stigma*, and *excisa*; I hope at some future date to dispose of these with greater certainty, when I thoroughly understand those in my own collection.

D. sericata, Mg., is a perfectly distinct and not uncommon species; it is much darker than the others, and has almost blackish legs, while the wings are entirely without even a stigma; Walker described it as a new species, which he called *L. glabrata* (Ins. Brit. Dipt., iii, 299), that name was, however, pre-occupied by Meigen (1818), and I see no reason to doubt its being Meigen's *L. sericata*. I have taken it in Sussex, Kent, in my own house, and once in abundance in a grass field near here; I think it is a May species only just extending into June.

D. dumetorum, Mg.: Walker has mixed up *D. dumetorum* and *didyma* in his descriptions in Ins. Brit. Dipt., iii, 296 & 297, because *D. dumetorum* is the species with two spots on the costa, and *D. didyma* the one with three spots, in other respects he is right, and all specimens named by him which I have seen were correct. I have seen the type of *L. transversalis*, Wlk., which is certainly *D. dumetorum*; while all the specimens I have ever seen called *L. oscillans*, Hal., were certainly *D. didyma*, and Haliday's description (Ent. Mag., i, 154), perfectly agrees with *D. didyma*. The habits of the two species are very distinct, *D. didyma* occurring almost everywhere that water runs down an almost perpendicular surface, such as sluice gates or overflow

from water mills, sides of waterfalls, and similar localities; while *D. dumetorum* frequents bushes in comparatively dry places: both have a wide range in Britain, as I have taken *D. dumetorum* from the Isle of Wight to Sutherland, and *D. didyma* from Devonshire to Sutherland.

(*To be continued*).

Salpingus mutilatus, Beck, a British insect.—Three examples of a *Salpingus* captured by myself on different occasions by evening sweeping in open beech woods on the chalk downs at Caterham, in September, 1872, and September, 1874, and a fourth taken in a similar manner at Gomshall, Surrey, in August, 1873, are referable to this species.

S. mutilatus, Beck (= *S. virescens*, Muls., 1856, *sec virescens*, Lec., 1850), has not hitherto been recorded from this country. Mulsant (*cf. Rostrifères*, p. 41) separated the species from true *Salpingus*, on account of the somewhat different structure of the rostrum, and placed it by itself in his section *Colposis*. In the general structure of the head and oral organs it is almost intermediate between the true *Salpingi* and *Rabocerus*, Muls.; the latter contains only one European species, *R. foveolatus*, Ljungh, and is not regarded by recent writers as generically distinct from *Salpingus*. The present insect will be readily known from our true British *Salpingus*, *S. ater*, *S. aeratus*, and *S. castaneus*, by the long exerted mandibles, the broadly flattened and almost concave frontal region of the head, the shorter thorax, the strongly impressed elytra, the very shining upper surface, the greenish-bronze colour, the reddish-testaceous labrum, mandibles and legs, &c.; from *S. foveolatus*, which it more nearly resembles in the structure of the mandibles, by the shorter and narrower rostrum, the differently coloured oral organs, the flattened frontal region, the differently formed labrum, the smaller size, the more shining and differently coloured upper surface, &c. All four examples are somewhat immature, and considerably lighter and less green in colour than in the figure given by Beck (tab. 5, fig. 27); the insect, nevertheless, could be thus identified. These specimens are coloured much as in *Rhinosimus planirostris*, and, indeed, bear a certain superficial resemblance (of course apart from the structure of the rostrum) to that common insect; they have long done duty in my collection for *S. aeratus*, an insect not, I think, thoroughly understood by British Coleopterists.

Herr E. Reitter has kindly verified one of these examples as above.

For further particulars regarding *S. mutilatus* I must refer to Beck, *Beitr. sur baier. Insekten*, p. 19 (1817); Mulsant, *Rostrifères*, p. 41 (1856); Abeille de Perrin, *Bull. Soc. Toulouse*, viii, pp. 26 & 28, &c. The insect is found in France, Bavaria, &c., but not very commonly; M. Perrin (*op. cit.*) records it from Boscodon, in the Hantes Alpes, and says it is found in pine (sapin) faggots, in company with *S. aeratus* and *S. foveolatus*.

NOTE.—I would here suggest the possibility of the occurrence of *S. Eryi* and *S. exsanguis*, Perrin, in this country; the former is very closely allied to *S. castaneus*, and the latter to *S. ater* and *S. aeratus*; *S. Eryi* has been taken in abundance at Sos in the dead branches of fruit trees.—GEO. C. CHAMPION, 11, Caldervale Road, Clapham, S.W.: November 13th, 1886.

Coleoptera in the neighbourhood of Bath.—The highest ground about here is Lansdown, a large flat table land of Great Oolite without trees, elevation about 800 feet. It is divided into fields by loose stone walls, and the stones at their bases form a good collecting ground. I have taken here, amongst other things, *Cyphrus rostratus*, *Amara bifrons* and *spinipes*, *Bradycellus distinctus*, *Trechus obtusus*, *Ocypus fuscatus*, *compressus*, and *morio*, *Xantholinus tricolor* and *fulgidus*, *Olisthopus rotundatus*, *Aphodius porosus*, *Barynotus obscurus* and *marenus*, and *Otiorhynchus tenebricosus* in profusion. On the other side of the valley Hampton Down is not so high, but is fringed with woods; I have found there *Badister sodalis*, *Taphria nivalis*, *Platyderus ruficollis*, *Amara rufocincta*, *Trechus micros*, *Calathus piceus*, *Quedius nigriceps* and *rufipes*, *Staphylinus stercorarius*, *Aphodius oblitteratus*, *sticticus* and *constans*, &c. Very near to the city is Little Solsbury, another good locality. It is a round hill with a flat top, at the base of which and at some distance from its sides is the Midford sand; the Inferior Oolite then follows, above which is a bed of the Fuller's-earth clay, and the Great Oolite caps the whole. On one side of it is a sloping sandy field, this is the locality for the *Onthophagi*; here *nutans*, *canobita*, and *fracticornis* are common, and *ovatus* abounds in sheep's-dung, also *Copris lunaris*, *Philonthus puella*, *Aphodius depressus* and *porcatus*, and all the commoner species. In a barren field near this spot, *Harpalus azureus* occurs in plenty, *punctatulus* sparingly, and *puncticollis* and *Brachinus crepitans* in company, but not *H. rufilabris*, which is found freely on Lansdown. Last season I found here one *Lebia chlorcephala*, also about twenty specimens of *Pterostichus picimanus* in a damp field on the clay near. In fields in the valley *Anisodactylus binotatus* occurs abundantly; *Pterostichus anthracinus* commonly, and many others more or less so, but I may mention *Stilicus geniculatus*, *Magdalinus barbicornis* and *Priobium castaneum*, the last rather freely. *Gyrinus marinus* abounds in the canal, and with it I took eighty specimens of *wrinator* and one *bicolor* in a corner; *G. natator* is common in ponds. *Halipus cinereus* occurs freely at Bitton Paper Mill, and *H. flavigollis* in the canal.

—ROBERT GILLO, 16, Lambridge Place, Bath: October, 1886.

Note on Scotch Coleoptera.—Early in October I found *Aëpus marinus* and *Micralymma brevipenne* on the banks of the Forth at Culross, N. B., in the greatest profusion, and on the Moors near, *Acidota crenata*; on the Pentlands, *Bradycellus collaris* occurred commonly, and on Arthur's Seat I took *Agathidium rotundatum* and *convexum*.—A. BEAUMONT, 30, Ladywell Park, Lewisham, S.E.: November, 1886.

Cafius fucicola in Scotland.—I have this year met with *Cafius fucicola* in its old Scottish locality, Dalmeny Park, on the shores of the Frith of Forth. Dr. Sharp, in his Catalogue of Scottish Coleoptera (Scottish Naturalist, ii., p. 379), casts great doubt on the authenticity of the record by the Rev. Mr. Little in Murray's Catalogue; but it is undoubtedly *fucicola*.—R. F. LOGAN, Colinton, Midlothian: November 10th, 1886.

Sphinx convolvuli in the Isle of Purbeck.—As *S. convolvuli*, after appearing in such exceptional numbers last year, seems to have been ^{Decidedly scarce} this season, it may perhaps be worth while recording the fact that I captured a specimen near

here on the evening of the 7th inst. It flew in at the open window, evidently attracted by the light in the room; but, unfortunately, it is in poor condition.—
EUSTACE R. BANKS, The Rectory, Corfe Castle: *October 20th, 1886.*

*Great abundance of *Plusia gamma*.*—During the present autumn *P. gamma* has appeared in swarms in this district, and was especially abundant during the mild weather at the beginning of October. They were particularly noticeable at dusk, when they hovered by hundreds round the flowers still remaining in the gardens. It would be interesting to learn whether the same phenomenon has been observed in other parts of the country, or whether this was only a partial visitation.—ID.

[*P. gamma* has been very scarce near London this year.—EDS.]

Anosia Plexippus, L. (*Danais Archippus*, F.) at Gibraltar.—A specimen of this most interesting butterfly was captured on the afternoon of October 24th, by Lieut.-Commander Cochran of H.M.S. "Grappler," in his garden at Rosia, at the foot of the rock, at rest on a bush of *Bignonia*. The insect, which I saw to-day, only just dead, in the possession of Lieut. Bolton, is a ♂ of average size and of the ordinary North American type; it is somewhat worn and faded, and one hind-wing is a good deal chipped; it looks as if it had been on the wing for a considerable time. I observe in Dr. Kelaart's "Flora Calpensis" (published in 1844) that no representative of the natural order *Asclepiadaceæ*, comprising the chief food plants of *Anosia Plexippus*, is found on the rock; but two of the *Apocynaceæ*, viz., *Vinca media* and *Nerium oleander* (the former wild, the latter cultivated) are abundant enough. If the larva will accept these as substitutes for its usual food plants (as it is said to do occasionally in South America with other "dogbanes"), I can imagine few places better suited, as regards climate, &c., for the ultimate naturalization in Europe of *Anosia Plexippus* than the rock of Gibraltar.—JAMES J. WALKER, H.M.S. "Grappler," Gibraltar: *October 26th, 1886.*

Acherontia Atropos in a bee-hive.—It is, of course, a very old story that *A. Atropos* enters bee-hives to steal the honey, but I do not know that one often hears of the great moth being caught *flagrante delicto*. However, I have lately heard of such a capture, and although I cannot give full particulars—it is hard generally quite to understand non-entomological reports of entomological facts—yet I believe there can be no doubt of the main fact in this case.

At a farm-house in the parish of Dartington, South Devon, on July 28th, 1886, the lads late in the evening noticed a peculiar noise at the bee-hives in the yard; they understood from it that some enemy was disturbing the bees, and called out the other members of the family to see what it was. Search was made, and one of the party with the kitchen tongs laid hold of the intruder, which, to the surprise of all, turned out to be a "great big moth," and continued to make the strange noise heard at first. It was covered with bees, and could not, or did not, fly; so, after the bees had retired, it was put under a tumbler, and kept there, till at the end of a fortnight it died. An entomological friend had the moth to set out, and he tells me there was no trace of any injury upon it, beyond that caused by the tongs. One

would much like to have tested the theory that the peculiar squeaking of *Atropos* affects the bees so as to prevent them from hurting it.—J. HELLINS, Exeter: October 16th, 1886.

Pterophorus dichroactylus and *P. Bertrami*.—In August last, Mr. G. C. Dennis of York and I found *Pterophorus dichroactylus* in plenty on our coast at Saltburn. In one of the ravines tansy grew in large and luxuriant patches, and on it *dichroactylus* had evidently long been at home. Mr. Stainton (Ent. Mo. Mag., ii, 137), Mr. Barrett (Ent. Mo. Mag., xviii, 177), and Mr. Sang (Ent. Mo. Mag., xviii, 143), satisfactorily pointed out the differences between this species and *Bertrami*, but none of them have recorded one important particular, which, if necessary, still further strengthens their conclusion, namely, that *dichroactylus* seems to be exclusively confined to tansy.* In the Saltburn ravine, and also all over the district, yarrow was in full bloom, and in equal luxuriance with the tansy, yet not a single specimen of *dichroactylus* was ever seen frequenting it, or any other plant but tansy. *Bertrami* evidently did not occur in the district at all, or we think we must have seen it during our fortnight's stay. Heinemann records it as feeding on *Tanacetum* as well as *Achillea*, but probably Mr. Barrett is right in believing that to be an error. Many of the *dichroactylus* we took were very worn, quite white indeed, but we each easily secured a good series of fresh and perfect specimens, which show the distinctions between it and the yarrow-feeding species—especially in the longer and finer pointed wing tips, and the yellower colour—most clearly. Any one having experience with both species *alive*, can scarcely help noticing the differences at once.—GEO. T. PORRITT, Huddersfield: November 4th, 1886.

Eudorea ulmella, Dale, and *E. conspicualis*, Hodgkinson.—I have, for a long time past, thought it possible that these two names referred to the same species, and

this suspicion has been confirmed by the inspection of the original specimens of *E. ulmella*, which Mr. C. W. Dale has kindly allowed me to see. There were originally three specimens taken in Hampshire, one of these is now in Australia, and the others are in Mr. Dale's collection. The specimen figured by Mr. Rye in Ent. Mo. Mag. for March, 1867, gives the idea of a narrow-winged insect, with a straight costa, but

this is due to the fact that the edge and end of the wing are somewhat turned up in the specimen, and there is no difference perceptible in the costa when it is compared with ordinary small specimens of *E. conspicualis*. In marking also they are identical. Both specimens of *ulmella* are smaller than the usual run of *conspicualis*, but I have smaller specimens of *conspicualis*. It may be that the home of *conspicualis* is more northern, and that southern specimens are smaller; the figure is from one of Mr. Dale's examples, drawn by Mr. Sang.—PHILIP B. MASON, Burton-on-Trent; November, 1886.

* Mr. Sang says (i. e.) the larva feeds with us invariably in tansy; Mr. Barrett, and Mr. Stainton both state that the larva feeds on tansy, and do not mention or suggest any other food-plant.—Eds.

Heinemann's Dicrorampha.—Mr. C. G. Barrett's well-known accuracy in the differentiation of closely allied insects entitles him to considerable weight as an authority in such matters; I regret, however, that I cannot concur in his recently expressed opinion that *distinctana*, Hein., is separable from the North Devon *consortana*. No two of the bred specimens of the latter insect submitted to him, a few weeks ago, were exactly alike, but there were certainly among them specimens marked precisely as Mr. Barrett says his German types are, and I consequently feel no little surprise that the fact should have escaped Mr. Barrett's practised eye.—RICHARD SOUTH, 12, Abbey Gardens, London, N.W.: November, 1886.

[I willingly admit that no two specimens in the series of *D. consortana* submitted to me by Mr. South were exactly alike, any more than any two specimens of any other species, are *exactly alike*; but the variations were slight, and by no means suggestive of their belonging to more than one species. No one of them agreed with either of my authentic specimens of *distinctana*, Hein.; but I fear that I cannot more clearly describe the distinctions between them than I have already done on p. 142 of the present volume. The only point of difference in my opinion between Mr. South and myself now appears to be as to the distinctness of *distinctana*, Hein., from *consortana*.—C. G. B.]

On the flight and pairing of Hepialus humuli.—Some ten years ago, in the Ent. Mo. Mg. (vol. xiii, p. 63), I made a note of an observation on *H. humuli*. This was a solitary observation, and, therefore, not of much weight, but it met with sufficient scepticism to lead me to believe that the fact recorded was a new one, and though it is highly probable that similar observations have since been made and recorded, they have not come to my notice, until, by a curious coincidence, Mr. Barrett's observations on *H. hectus* this year. I was therefore pleased this summer to find *H. humuli* abundant in a meadow conveniently near, and devoted a short time on several evenings to observing its flight.

The first week in June is the usual date for its being fully out, but this year it was not out till ten days later, and it was not in full flight till the 4th week of the month, and it was on the long evenings following June 21st that I made my notes.

The flight lasts but twenty minutes, on a dull, overcast evening, from 8.50 to 9.10, and when the sky is bright and clear, from 9.10 to 9.30, beginning at the first indication of dusk, and ceasing when the white male becomes a somewhat dim object. At first, an odd male or two may be seen creeping up the grass stems and taking wing: often, at first, making a wild dash or two of some yards, before settling down to the ghost-like hovering, and before the vagaries of one or two specially observed have been noticed, the males are seen to have turned out in force, and to be busy hovering in all directions, and one will occasionally dash off for a few feet or yards and take up a fresh spot, or passing near another, will be followed for a short distance, and so it often happens that two males may be seen hovering close together, but taking no notice of each other. Meantime, sundry ♀ may be observed hovering over the tops of the grass, but instead of keeping to one spot, they steadily move forwards; when these pass near the hovering males, they rarely attract their attention, or only draw them out of position a few inches to at once return. The female moths acting in this way are ovipositing, dropping their eggs loosely into the grass,

and if captured, continue to do so into the hand or into the box. But now and then,—I made the observation six times in four evenings—and from the number of ovipositing ♀, I have no doubt I was a day or two late, a ♀ moth courses along in a wilder manner, buzzes against or collides with, or appears to do so, a hovering male and settles as soon as her impetus is exhausted, on the grass a few feet in advance; the male, so challenged, follows almost simultaneously and settles immediately on the same spot.

On one occasion I had half a dozen ♂ *humuli* in view; of these, one was within two yards of me, another three or four yards further, and two more close together were further and a little to the left. Of these last, one was a very diminutive specimen; a ♀ *humuli* came up with a dash to the ♂ nearest me, but passed by within three or four inches without attracting his attention, then went straight for the second, but passed him by in the same manner, going for the two that hovered close together, touched the diminutive one, and at once settled down with him a few feet further on. This case emphasized two circumstances that I had already satisfied myself about, viz: that the female makes an actual selection, and that she actually strikes against the selected male. It also appeared that she had committed a serious error in selecting the smallest specimen of the four, and doing so apparently with decided intention. It has occurred to me, however, that the two moths hovering together were mistaken for one very large specimen; the silvery brightness of the ♂ is no doubt what the ♀ is attracted by, and an excess of this must be a determining point, and this may account for the decided tendency observed to two ♂ hovering together, or sometimes even three. One is tempted to theorise as to the diminutive antennæ being correlated with the ♂ not having to find the ♀ (by scent?), but the habits of other members of the family must be better known first.

When the twenty minutes of suitable light have elapsed, any male under observation flutters down into the grass, closes his wings and creeps down to the roots, and by the time one is satisfied that a secure hiding place till the next period of flight is his only object, it is found that all other specimens have also disappeared—the increasing darkness renders it impossible to say certainly whether all the ♀, which are now very inconspicuous on the wing, act in a similar manner, and I have not been heroic enough to ascertain whether or no another flight takes place in the morning twilight.—T. A. CHAPMAN, Binghill, Hereford: *November 11th, 1886.*

Note on Aleurodes vaporariorum, Westw.—On May 18th, in Mr. Stainton's forcing-pit, the leaves of cucumber plants (*Cucumis sativus*) were in a state of dilapidation from the attacks of larvæ of *Aleurodes vaporariorum*; these having successfully passed through that transitory stage, and then that of pupa, had emerged in the unspotted whiteness of their perfect condition, and existed in great abundance on and flying about the plants. The under-side of the leaves was to a great extent covered by the empty pupa skins and a few larvæ, all tightly adherent; the rest of the space being mostly occupied by *Dactylopius destructor* in all stages of growth (*cf. p. 154 ante*), efficient assistants, if not prime movers in the havoc, leaving only small portions of the leaf free of tenants. In a microscope, under a half-inch objective, the larvæ with their projecting, glassy, transparent tubes on the circumference, and the very long, hair-like and extremely brittle ones on the back, so characteristic of the species, are wonderfully beautiful objects, or as *Sigognor* not unaptly says (*i. e.*), “*Cette magnifique espèce.*”

On October 8th Mr. Billups sent to me a box which contained some leaves of Tomato (*Lycopersicum esculentum*) which he had just received from a correspondent whose tomato plants were being ruined by the agency of the insects infesting them. The under-side of the leaves was to a great extent covered with the empty pupa-skins and a few larvae of an *Aleurodes*; the leaves were much crumpled and somewhat dried, and in consequence the examination of the adherent insects was not easy, but on some of them there remained tubes on the margins, like those of *A. vaporariorum*, and on the dorsum long hair-like tubes (more or less broken) as in that species, so that I have no doubt of its identity. In the box which contained the leaves there were also a few of the perfected insects in bad condition, which had evidently emerged from pupæ during the transit.

The species was first described and figured by Westwood in the "Gardener's Chronicle," 1856, p. 852 (the figure only without name is again given in the same journal, February 13th, 1886, p. 213), from *Gonolobus*, *Tecoma*, *Bignonia*, *Aphelandra*, and *Solanum*. It was described by Frauenfeld in the "Verhandl. z.-b. Gesells. Wien," 1867, p. 798, but he does not give the name of the plant on which he says he reared it. It is described and figured by Signoret in the "Ann. Soc. Ent. France," 4 Ser., viii, p. 387, pl. ix, fig. 3, from *Salvia splendens* and *Lantana Camara*. All the plants, as well as those now mentioned, are natives of tropical countries, and in northern climates require artificial heat and protection under glass. Belonging, as they do, to several Natural Orders, it is evident the species has a wide range of food-plants, on which, in their cultivated state, at all events, the insects cause great deterioration of growth.—J. W. DOUGLAS, 8, Beaufort Gardens, Lewisham: November 8th, 1886.

THE SOUTH LONDON ENTOMOLOGICAL AND NATURAL HISTORY SOCIETY, Oct. 7th, 1886: R. ADKIN, Esq., F.E.S., President, in the Chair. Mr. Billups exhibited *Echthrus lancifer*, Gr., a species of *Hymenoptera* new to Britain, taken by him at Walmer in August last. Mr. West (Streatham) exhibited a bred series of *Spilosoma fuliginosa*, L. Mr. Wellman, examples of second broods of *Melanippe tristata*, L., *Acidalia emarginata*, L., *A. rusticata*, Fb., and *A. strigillaria*, Hb., all reared from ova. Mr. Jager, *Callimorpha Hera*, L. (including the variety *lutescens*, Staud.), taken in the South of Devon; forms of *Bryophila muralis*, Forst., from Dawlish. Mr. J. T. Williams, *Eupithecia linariata*, Fb., bred from larvæ which fed up and emerged in about fourteen days. Mr. South, series of *Thera variata*, Schiff., from Switzerland, England and Scotland, and contributed notes thereon. Mr. Eliasha, *Agrotis Ashworthii*, Dbl., and *Dasympa rubiginea*, Fb. Mr. Adkin, *Lepidoptera* from East Sussex, among which were varieties of *Lycæna Icarus*, Rott., and *L. Corydon*, Fb., *Diasemia literata*, Scop., and contributed notes on the latter. Mr. J. J. Weir, a variety of *Pyrameis cardui*, L., from Graham's Town; varieties of *Colias Electra*, L., from the same locality, showing that the species exhibited a similar dimorphic condition to that which obtains in *Colias Edusa*, Fb. Mr. Cooper exhibited a brightly coloured variety of *Vanessa urticæ*, L. Mr. Sabine, varieties of *Papilio Machaon*, L., &c. Mr. Weir remarked on certain specimens exhibited by Mr. Sabine, which he referred to hybrids between *Lycæna bellargus* and *Icarus*. Mr. West (Greenwich) exhibited two species of *Coleoptera* from Shirley Heath, viz., *Balaninus rubidus*, Gyll., and *Eriphelinus pectoralis*, Panz. Mr. T. R. Billups, a species of *Hydradephaga*, *Colymbetes fuscus*, L., from which had emerged a

Lepidopteron, probably *Endrosis fenestrella*, Scop., Sta. The empty pupa case being partly visible and remaining firmly attached to the body of the beetle.—H. W. BARKER and W. A. PEARCE, *Hon. Secs.*

October 21st, 1886.—The President in the Chair. Mr. Billups exhibited the following Ichneumonidae:—*Trogus lutorius*, Fab., and *T. alboguttatus*, bred from *Chærocampa porcellus*, L., also *Apanteles jucundus*, Marsh., and cocoons. Mr. Levett and Mr. Watson, *Acherontia Atropos*, L. Mr. Helps, *Lasiocampa quercifolia*, L. Mr. West (Streatham), two yellow varieties of *Bryophila perla*, Fb. Mr. W. G. Sheldon, *Plusia chryson*, Esp., *P. festucae*, L., *P. pulchrina*, Haw., &c. Mr. Fiklin, a long series of *Pædisca sordidana*, Hb. Mr. Jager, *Sphinx convolvuli*, L., taken at Starcross, Devon. Mr. Gibb and Mr. Tugwell, *Zygæna exulans*, Hoch., the latter gentleman called attention to two examples of the Swiss form of the species. Mr. Mera, *Eugonia autumnaria*, Wernb. (bred). Mr. Elisha, *Dianthæcia irregularis*, Hufn. (bred). Mr. Wellman, a number of species taken or bred during the season. Mr. Shearwood, preserved larvae of *Toxocampa pastinum*, Tr., *Stilbia anomala*, Haw., *Nola albulalis*, Hb., &c. Mr. Adkin, *Polia flavicincta*, Fb. (bred); and on behalf of Mr. Farren, of Cambridge, long series of *Bryophila muralis*, Forst., *B. impar*, Warren, and *B. perla*, Fb., the first named from Folkestone, and the last two from Cambridge; and read a letter from Mr. Farren pointing out the distinguishing characteristics of *muralis* and *impar*. For the purpose of comparison, Mr. Wellman exhibited his series of *muralis*, and Mr. Jager, reddish forms of the same species from Folkestone. Some discussion then ensued as to whether *impar* was a distinct species or only a variety of *muralis*, in which Messrs. Weir, Tugwell, Wellman, Carrington and others took part.

November 4th, 1886.—The President in the Chair. Mr. E. Sabine was elected a Member. Mr. Billups exhibited seven male specimens of *Halictus xanthopus*, Kirby, from Reigate, and contributed notes. Mr. West (Streatham), *Eubolia cervinaria*, Schiff. (bred). Mr. Wellman, *Dasydia obfuscaria*, Hb., and *Eupithecia togata*, Hb. Mr. A. E. Cook, *Vanessa C-album*, L., from Wales. Mr. Jager, a variety of *Hypsipetes ruberata*, Frr., from Brockenhurst. Mr. Sheldon, dark forms of *Hypsipetes sordidata*, Fb., from Cadder Moss, Lanarkshire. Mr. T. W. Hall, *Cerastis vaccinii*, L., and *C. spadicea*, Hb. Mr. J. T. Carrington, six of the spurious varieties of *Vanessa urticae*, L., referred to at the last meeting of the Society as having been offered for sale. Mr. R. South, *Gnophos obscuraria*, Hb., from Folkestone, the New Forest, Perthshire, North Devon and Lewes. Mr. Rose, *Lycæna virgaureæ*, L., from Norway, varieties of *Boarmia repandata*, L., from the Isle of Wight and the Lake District. Mr. Adkin, a variety of *Euchelia jacobææ*, L., in which the red markings were absent from the right wing. Mr. Chaney, the following Coleoptera: *Sphodrus leucophthalmus*, L., from Peckham, *Molytes germanus*, L., *Agabus nitidus*, F., from Sandown, and *Barynotus mærens*, F., from West Horsley. Mr. Billups, Orthoptera: *Gomphocerus rufus*, Ch., from Reigate; Hemiptera: *Corimelæna scarabæoides*, L., and *Sehirus morio*, L., both from Reigate.—H. W. BARKER and W. A. PEARCE, *Hon. Secs.*

The following were elected Fellows, viz., Mr. Peter Cameron, of Sale, Cheshire; Mr. F. Archer, of Crosby, Liverpool; Mr. H. J. S. Fryer, of Yokohama, Japan (formerly Subscribers); Mr. H. Norris, of St. Ives, Hunts; Mr. N. P. Fenwick, of Surbiton Hill; Mr. John Brown, of Cambridge; Mr. J. P. Tutt, of Westcombe Park, Blackheath; and Mr. A. P. Green, of Colombo, Ceylon.

Mr. E. B. Poulton exhibited a mass of minute crystals of formate of lead, caused by the action of the secretion of the larva of *Dicranura visula* upon suboxide of lead. He stated that a single drop of the secretion had produced the crystals which were exhibited; and he called attention to the excessively high percentage of formic acid which must be present in the secretion, and to the pain and probable danger which would result from being struck in the eye by the fluid which the larva had the power of ejecting to a considerable distance. A discussion ensued, in which Messrs. White, Kirby, Slater and others took part.

Mr. S. Stevens exhibited a specimen of *Laphygma exigua*, recently captured by Mr. Rogers in the Isle of Wight.

Mr. W. F. Kirby exhibited, and read notes on, a specimen of *Perilampus maurus*, Walk., recently bred by Mr. Walter de Rothschild from *Antherea Tirrea*, Cram., one of the rarer South African *Saturnidae*.

Mr. T. W. Hall exhibited a number of specimens of *Xanthia fulvago (cerago)*, somewhat remarkable in their variation, and showing a graduated series, extending from the pale variety *flavescens* of Esper, to an almost melanic form.

Mr. W. C. Boyd exhibited, and made remarks on, the larva of a species of *Ornithoptera* from New Guinea.

Mr. H. Goss exhibited a series of *Bankia argentula* collected by him in Cambridgeshire, in June last; and also, for comparison, a series of specimens of the same species taken at Killarney in June, 1877. It appeared that the Irish form of the species was larger and more brightly coloured than the English.

Mr. Eland Shaw exhibited a female specimen of *Decticus verrucivorus*, Linn., taken in July last, at St. Margaret's Bay, Kent.

Mr. Waterhouse recorded the recent capture of *Deiopeia pulchella* at Ramsgate, by Mr. Buckmaster; and the capture of *Anosia Plexippus* at Gibraltar was also announced.

Mr. J. W. Slater read a paper on "The relations of insects to flowers," in which he stated that many flowers which gave off agreeable odours appeared not so attractive to insects as some other less fragrant species; and he stated that Petunias, according to his observations, were comparatively neglected by bees, butterflies and *Diptera*. Mr. Distant, Mr. Stainton, Mr. Weir, Mr. Stevens and the President took part in the discussion which ensued, and stated that in their experience Petunias were often most attractive to insects. Mr. Stainton referred to the capture by himself of sixteen specimens of *Sphinx convolvuli* at the flowers of Petunias, in three evenings in 1846.

Jonkeer May, the Dutch Consul-General, asked whether the reported occurrence of the Hessian Fly (*Cecidomyia destructor*) in England had been confirmed. In reply Mr. McLachlan stated he believed that several examples of an insect thought to be the Hessian Fly had been bred in this country, but that everything depended upon correct specific determination in such an obscure and difficult genus as *Cecidomyia*.—H. Goss, *Secretary.*

AËPOPHILUS BONNAIREI, SIGNORET.

BY E. D. MARQUAND.

It may be remembered that the first British specimens of this curious sub-marine Hemipteron were taken by the late Mr. Frederick Smith, some years ago, at Polperro, in East Cornwall, and their discovery was announced by Mr. C. O. Waterhouse in the Ent. Mo. Mag., vol. xviii, p. 145. Since that time the insect has not, so far as I am aware, been recorded from any other station, although, from a paper published in "Science Gossip," in March, 1886, it would seem to occur not uncommonly on the coast of Jersey. I have now the gratification of adding another locality, also on the Cornish coast, but some fifty miles to the westward of Polperro, viz., the rocks at Mousehole, near Penzance. The original specimens discovered at the Ile de Ré, in the Bay of Biscay, as well as those from Jersey, are said to have occurred under stones deeply embedded in mud or loose gravel; but my experience shows that these insects are not restricted to such habitats, but may be found on rocky shores as well, though always at the extreme verge of low water mark.

On November 12th last, I was searching for *Polyzoa*, during the low spring-tide, at Mousehole, about two miles from Penzance, when, at the very edge of the laminarian zone, I saw a remarkably fine specimen of the large star-fish, *Uraster glacialis*. I pulled it out of the cranny where it lay high and dry, and turned it over, and then saw, running swiftly over the slimy cream-white under-side of the star-fish, a minute object, which I took for an *Acarus*, and "bottled." A moment's glance with the lens, however, showed me it was a bug of some sort, and a careful examination of the *Uraster* furnished three mature examples, which I secured. Immediately on my return home, I forwarded one of the large specimens alive to Mr. Edward Saunders who kindly replied at once, confirming my suspicion that it was *Aëpophilus Bonnairei*.

Why a small colony of these *Hemiptera* should have selected this particular star-fish to locate themselves upon, I cannot conjecture, because I have examined scores of the same species at various seasons of the year on the same rocks and never saw an insect upon any. The coast just here is entirely rocky, so that *A. Bonnairei* is by no means confined to muddy or sandy shores, and this may serve as a hint to those who are on the look out for the insect.

I ought to mention that this is not the first time I have met with it. About two years ago, also at Mousehole, I captured two specimens

among stones at low tide, but these I unfortunately lost before they were identified.

That it is very local and rare in the extreme west of Cornwall, I am convinced, for during the last six or seven years I have worked the shore a good deal, both about Penzance and in many parts of the Land's End district, and I never met with it save on these two occasions. There is no reason why it should be confined to the Cornish coast, and we shall probably soon hear of its occurrence in other districts.

If this singular Hemipteron should turn up in some strange situation, it may be at once recognised by its general resemblance, roughly speaking, to a medium-sized, rather narrow, bed-bug, with partially developed, velvety, mottled-brown elytra, and very prominent eyes of a brilliant ruby-red.

Alphington, Exeter :
November 29th, 1886.

[The association of *Aëpophilus* and *Uraster* may not indicate any important significance; but it is suggestive and decidedly worthy of further investigation.—Eds.]

COLEOPTERA AT PORTLAND.

BY JAMES J. WALKER, B.N., F.E.S.

The following notes on the *Coleoptera* of the Isle of Portland and the Chesil Beach, made while I was stationed there in H.M.S. "Cherub," from June, 1885, to the beginning of last October, may be worth putting on record, though the localities have already been fairly well worked. It will be seen that I have been fortunate enough to meet with most of the Portland specialities, although, having been absent on many occasions during the above period, often for several weeks together in the best part of the season, many species which ought to have been taken in plenty (as *Omophlus armeriae*, &c.), have been found by me but rarely. A short description of the localities may be of interest.

The Isle of Portland, as it is called, though really a peninsula joined to the mainland by the narrow isthmus of the Chesil Beach, is, as is well known, mainly a huge mass of oolitic limestone, varying in elevation from nearly 600 feet at the north end, to less than 60 feet at the southern extremity at Portland Bill, the slope being very regular from north to south, and the surface fairly uniform, except where cut up by the extensive quarries. The east and west

shores of the island are bold and rocky, in most places quite perpendicular, though there are some very nice bits of rough broken under-cliff here and there on the eastern side, which produce a very varied and interesting vegetation, and are the best localities for *Lepidoptera* in the island. Few beetles are to be found here however, the best place for these being the summit of the western cliffs, and near the Bill, where, under the innumerable loose stones, many interesting *Geodephaga*, &c., are to be found—not to mention a superabundance of earwigs, snails, slugs, ants, and especially wood-lice, which latter vermin are in greater profusion at Portland than I have anywhere else seen them. The quarries as a rule are unproductive, nor have I found any good *Coleoptera* on the steep flowery slopes on the north front below the Verne Fort.

The Chesil Beach is even more interesting, being a long, gently curved ridge of rounded pebbles, extending from Portland to beyond Abbotsbury, a distance of more than ten miles, its average width being about 200 yards, and in height some 30 feet above high water mark. A large shallow lagoon, called the "Fleet," is shut off from the sea by the pebble ridge, and opens into Weymouth Bay by a narrow mouth, crossed by a wooden bridge known as the Ferry Bridge. Adjoining this bridge, on the Portland side, is a narrow strip of low sand-hills, intersected by the railway and the road to Weymouth; these are covered with a profuse and varied growth of flowers in the summer (*Ononis*, *Anthyllis*, *Lotus corniculatus*, and *Armeria vulgaris* forming the chief part), and are most delightful collecting grounds. Sweeping is, however, of very little avail (as in Portland); the only beetle which appears to frequent the flowers being *Dolichosoma nobile*, which occurs in vast profusion on the thrift blossoms in June. On the right of the road, looking towards Portland, are some damp saline hollows between the road and the pebble ridge, swarming with *Bledii*, *Pogoni*, *Dichirotrichus* of both sexes, *Broscus*, &c., and at low water a wide expanse of tidal sand is exposed at the end of the "Fleet," which is always worth inspecting. Close to Portland Station the sand-hills disappear, the road and railway running close to the beach, but there are some very good places at the foot of the railway-bank, on which *Crithmum maritimum* grows in abundance.

Among a large number of species of *Coleoptera* met with, the following appear worthy of record:—*Cillenus lateralis*, plentiful, in early summer, on tidal mud and sand near the ferry bridge; *Adeloria picimana*, abundant under stones in very dry places on the west cliffs; *Amara convexiuscula*, with the preceding, not rare; *Licinus silphoides*, common, and generally distributed, occurring all over the island

as well as on the beach ; *Masoreus Wetterhali*, common on the beach, most plentiful in August, under stones, also in moss in the winter ; *Cymindis axillaris*, scarce, on the west cliff. The genus *Harpalus* is very well represented at Portland, as, besides the universal *H. ruficornis* and *proteus*, I have met with, on the west cliffs, *H. sabulicola* (fairly common), *rotundicollis* (abundant), *azureus* (not rare), *puncticollis* (common, with one or two specimens which appear to be *parallelus*, Dej.), *rubripes* (common, also on the beach), and *caspicus* (very plentiful, an entirely black variety, not rare) ; while on the beach *H. attenuatus*, *neglectus* (not rare), *melancholicus* (one specimen only in June, 1885), *serripes* (common), *anxius* (abundant), and *vernalis*, have occurred, the last-mentioned at rare intervals, and always singly ; *Scybalicus oblongiusculus*, evidently rare, as I took only one specimen, in September, 1885, on the west cliffs ; *Bryaxis Waterhousei*, abundant in saline spots near the railway bank, also on the island, near Portland Bill ; *Claviger forsolatus*, very plentiful in nests of *Lasius flavus* (I have found over 40 in one small nest), more rarely in those of *L. niger* ; *Phytorus spinifer* and *balticus*, plentiful on sunny afternoons in holes in the sand dug as traps for *Acritus punctum* (p. 16), on one occasion over 60 specimens of *P. balticus* were taken out of one small hole ; *Homalota casula*, abundant in short moss on the sand, in winter and early spring, also under stones ; *Lithocharis fuscula*, one only, on the railway bank ; *Diglossa mersa*, frequent in sand-holes, also running over wet sandy mud below high water mark ; *Staphylinus stercorarius*, a few under stones on the west cliffs, in August ; *Ocyphus ater*, common, and generally distributed ; *Philonthus fucicola*, in seaweed, not common ; *P. sericeus*, frequent, in sand-holes ; *Xantholinus tricolor*, common, under stones on the west cliffs ; *Bledius spectabilis*, very abundant in sandy mud near the ferry bridge, but difficult to obtain in any numbers, owing to the depth to which it burrows ; *B. tricornis*, in a moist saline place (an old raised beach) near Portland Bill ; *B. unicornis*, very plentiful in May, with *spectabilis* ; and *B. arenarius*, extremely abundant in tidal sand, accompanied by *Dyschirius thoracicus* in numbers ; *Oxytelus maritimus*, very plentiful in tidal refuse, and "traps;" *Trogophlaeus halophilus*, locally common under small stones in a saline place by the railway bank ; *Ptenidium punctatum*, plentiful in "traps" in the sand ; *Platynaspis villosa*, one specimen, Chesil Beach, by cutting grass tufts in January ; *Carcinops minima*, frequent, under stones and in moss ; *Throscus obtusus*, one specimen only, in a haystack near Wyke Regis, in February ; *Cardiophorus asellus*, fairly plentiful for about a fortnight, at the end of April and beginning of May, under stones on the sand-hills ; *Chrysomela haemoptera*, very abundant in the same locality ; *Omophlus armeria*, very local on grass and herbage near the ferry bridge : unfortunately, I missed the best time for this fine insect, and took only a few specimens ; *Anthicus Schaubi*, locally plentiful (most abundant in August) under small stones, &c., near the bridge ; *Nacerdes melanura*, not rare, about old timber, &c. ; *Trachyphlaeus alternans*, only one, in an ant's nest ; *Otiorrhynchus ambiguus*, common in the spring under stones, &c., on the beach ; *Sitones Waterhousei*, abundant on *Lotus corniculatus*, and *Orthochates setiger*, at roots of herbage on the beach, also in tufts of grass in the winter ; *Rhinocyllus latirostris*, occasionally on road-side thistles on the island ; *Mecinus circulatus*, two or three in moss on the beach ; *Tychius Schneideri*, one only, on the east cliffs, in June ; *Sibynes arenaria*, locally abundant at roots of *Arenaria marina*, near the railway bank ; *Baris laticollis*, occasionally crawling on

walls (I could not find its head-quarters); and one or two *Hylastes obscurus*, by casual sweeping. *Acritus punctum* continued to occur in fair abundance up to the end of May, but only one more *Pentarthrum Huttoni* (p. 17) was obtained, in exactly the same spot as the first two specimens, though I spent a good deal of time in endeavouring to trace the insect to its head-quarters.

H.M.S. "Grappler," Gibraltar:

November 4th, 1886.

FURTHER NOTES ON THE DEVELOPMENT* OF THE EMBRYO
IN EGGS OF *BOTYS HYALINALIS*.

BY W. B. JEFFREY.

On the 1st of August last, having secured a batch of nine of these singularly flat and transparent eggs laid on a slip of glass, I kept them under the microscope during the 12 days of incubation, watching them as frequently as possible, and making notes of what I saw.

As some extracts from these notes may interest your readers, I make the following selection:—

When first laid, the contents of the egg seem of a perfectly homogeneous fluid nature.

In 8 or 9 hours after, the contents show as fine granules of yolk slightly denser in the middle of the egg—the blastoderm can be already traced as an extremely fine marginal line, which, at some parts, the granular contents did not quite reach, the margin of reticulated chorion showing as a clear space all round.

When about 12 hours old, the mass of yolk-granules were observed to be closer to blastoderm all round, but the outline of the latter had become irregular and depressed on one side.

In 15 hours, this depression had increased to a sharp angle, but in another hour, had returned to its original contour, only with a slightly increased space of clear shell beyond.

When 22 hours old, the margin was observed to be crenated with protuberances—from the aggregation of granules having the appearance of nucleolated cells—but general contour regular.

These irregularities of the margin of the yolk-sac had increased by next morning, with one large, almost triangular, hump at one place.

Some 28 hours had now elapsed since the eggs were laid.

When 30 hours old, the first faint signs of transverse septa noticed, caused apparently by the folding in of the yolk sac to form the amnion. It had the appearance of a melting away of the granules.

* Dr. Osborne has an article on this subject in No. 242 of *Science Gossip* for February, 1885, where, at p. 33, a few figures are given.

Rapid changes now take place in the outline of the yolk-sac, appearing as if broken at one side, and sometimes at both sides, as the amniotic sac is being folded in from it, in 38 hours there is a fold from the other side, and in 40 hours these two masses unite, when it bears a fanciful resemblance to a cottage loaf.

The outer mass of yolk is now composed of spherules containing granules, very irregular in outline, and broken as it were on each side, continually changing its shape, with a flowing and pressing motion on the inner sac. In 44 hours, central mass melting into one rounder mass, and in 48 hours, the outer mass or annulus of yolk, closing round still more, with a slender scroll just traceable at one side of the inner sac.

In 54 hours, this scroll has developed a funiculus, connecting the embryo with the annulus of yolk; the inner sac is now distinct enough with the oval outline of the egg.

The development of the embryo now proceeds in this inner sac, the ends curving twowards the funiculus till it comes to resemble somewhat the section of an agaric. In 60 hours, it is curved still more.

In 72 hours, it may be compared to the capital of an Ionic column; it now becomes flattened ventrally with the faintest indication of segments forming at this part. A clear concentric line is now left between the developing embryo and the amniotic sac. The yolk-granules are now arranged in loose masses in the annulus, so much detached, in some places, as to leave a clear space through which you could see the distal chorion. Now about 80 hours since the eggs were deposited.

We have now reached the *Fourth day* of incubation. Up to this time, great changes had taken place in the outer mass or annulus, but, after this, it is subject to but little change, except in diminution of bulk, as the yolk granules are absorbed by the growing and continually changing embryo. Towards the close of the fourth day, the embryo was observed to have increased in bulk with a peculiar bladdery appearance, and a clear fissure in funiculus. Three hours later, this clear space becoming obliterated, as also those in annulus noticed above. The yolk-granules becoming denser, especially at micropylar end where the annulus is broadest, and the spherules closer. At the close of this day, the ventral segments becoming better defined, though much obscured by yolk-granules of annulus.

Fifth day, at 7 a.m.—The scrolls formed by the embryo losing their double character, being so much obscured at head end (in all cases towards the micropyle), that the tail comes to look more like a

horn. At 7 p.m.: granules clearing away from margin of embryo, leaving the crenated edge, forming into segments, more discernible. 10 p.m.: indication of legs budding on some of them.

Sixth day, 7 a.m.—Clear space at margin of embryo increased, so that 9 ventral segments could be distinctly counted. 11 a.m.: funis dwindling more into the "bird's beak" form, curved and darker. At 5 p.m.: the 12 segments on the ventral region can now be made out, and the six thoracic legs. At 7 p.m.: everything getting more distinct, with sundry outlines of the head, and even the eyespots appearing as minute brown dots in clusters of six. At 11 p.m.: a slight indication of incurvature of tail in the most forward specimens.

Here I must acknowledge the kindness of Dr. T. A. Chapman, of Hereford, in allowing me to see a number of drawings taken from another lot of these eggs, which I had the pleasure of sending him. They were 7 days in advance of those I was observing, his figures commencing July 31st, being in the sixth day of incubation. In most cases showing only the embryo, and taken on a large scale, with the aid of a camera lucida, they give the details very plainly. Special attention was given by Dr. Chapman to the segmentation, and his drawings may be said to contribute to the evidence already recorded in favour of the head consisting of four segments.

Seventh day, 5.20 a.m.—The terminal segment has become ventrally incurved, gradually increasing in length. This incurvature perceptibly increased in two hours more, with outline of anal segment, the thoracic legs become jointed, and projecting into clear concentric space, pointing towards the tail. Soon after noon, the anal segment had reached to the first pair of thoracic legs, and I could plainly *see it advancing towards these legs, and actually push them forwards in its course.* At 6 p.m. the anal segment had reached quite to a level with the eye spots—pressing all the thoracic legs down in its course. While this has been going on, the abdominal legs have developed, and now show plainly in the arch of the loop, though not so much so as the thoracic legs, and taking a different direction from the torsion now setting in. With this rapid growth of the dorsal region, the umbilical stump has been drawn out as it were into a dark, curved, club-shaped mark, following the growth onwards, and persisting as the intestine. At 9 p.m.: dorsal region still extending, and now showing segmental divisions corresponding with the ventral. Those most advanced show the torsion of the head now taking place, by the increasing distance between the eyes, both now becoming very plainly visible.

Eighth day, 7 a.m.—Fine dark yolk-granules are flowing over the

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head and into the loop, obscuring more or less these parts. At 9 a.m., these granules clearing away somewhat, so that final curve of tail could be seen commencing, and apparently clearing away the yolk-granules that it may have forced into the centre loop. At noon, the tail more decidedly working round, the anal prolegs projecting plainly into the loop. Soon after noon the first larval movement was noticed, being a decided heaving of the abdominal segments throughout their length, leaving the anal prolegs more compact in the centre, while the whole body seemed to get at once closer to the now narrowing annulus. 5.30 p.m. : this movement continued in others, as the final curving of the anal segments became complete. 6.30 p.m. : a string of fine clusters observed in dorsal region, indicating position of dorsal vessel. Intestine continues dark, and ends apparently rather abruptly, but a delicate outline, as of the bowel, can be traced beyond, in the posterior segments.

Ninth day, 7 a.m.—Dorsal vessel become more decided. Serous membrane distinct enough, and the outline of the amniotic sac still to be traced. Eyes become darker and more contracted and crescentic. Outlines of oral organs appearing. 9 a.m. : first pulsations in dorsal vessel noticed at intervals of from 20 to 30 seconds. At noon, timed again about the same. At 5 p.m. : a little more frequent; counted occasionally from 7 to 11 p.m., with a similar result. Posterior bowel more plainly seen, also a sort of tube each side of the intestine, as it were enclosing it.

Tenth day, 7 a.m.—Counted pulsations at intervals of 15 seconds, though still irregular, as sometimes they may be noted 10 seconds, or even less apart, at other times there would be a rest of 20 seconds or more. At 9 a.m. : counted five or six beats per minute. Serous membrane plain enough as a fine marginal line; another, but very faint, line, still marked the amniotic sac as being entire, but difficult to distinguish from dorsal margin of body. Balls of yolk-granules collecting near mouth parts; œsophagus just becoming visible in outline. 8 p.m. : circulation more regular, counted for several consecutive minutes six beats per minute. Serous membrane easily traced, but the line marking amniotic sac with difficulty. Soon after this, thorax seemed detached from annulus, leaving an oblong mass of granules on the annulus, where it had been attached. Simultaneously with this, the first *efforts* at deglutition in œsophagus were noticed, but nothing drawn down at present; and, as more than twenty hours elapsed before yolk-granules were taken in at the mouth, it is very probable, as Dr. Chapman suggests, that nutriment is absorbed by

cutaneous endosmosis during this interval. At 4.30 to 4.35 p.m. the first tracheæ came suddenly into view. As the tracheæ were almost invisible in some of the other larvæ, I watched one closely, with the view of noting the cause of their so suddenly becoming conspicuous, when at 5.10 to 5.15 p.m. I distinctly saw them injected, as I suppose, with air for the first time. 5.15 p.m.: the filling of the tracheæ commenced in the posterior segments, a sort of cloud gathering at the bend where it is close to the head, and in a line with the eye. I saw *an apparently dark fluid start from this spot, and creeping along with a sort of spasmodic effort, filling the branches in its course, till it reached the head, and the whole tracheæ became conspicuously visible on that side of the body.* At 6.30 p.m. another egg was watched, which gave indications of the tracheæ being about to be filled, in the shape of a dark blotch, on the bend of the body, by one eye. The appearance of this blotch is preceded by a dark cloud of granules from the annulus, which, from the pressure of the growing larva, is forced here between the head and the curve of the body, as the only part where it can find access—and, I apprehend, it is now that the amnion is ruptured—admitting air to the tracheæ. Certain it is that after the injection of the tracheæ, it was in vain to look for any other envelope than the outer one, or serous membrane. 9 p.m.: tracheæ developed in all except No. 2 egg. 11 p.m.: pulsations but little increased, at the most, eight per minute.

Eleventh day, 4.30 a.m.—Tracheæ not yet to be seen in No. 2 egg.
At 7 a.m., by *carefully examining, could define the margin of the amniotic sac in some parts of this egg still*, as it must be 16 or 18 hours behind the others. The mouth parts still hyaline in this one, but chitinized in all the others, though even these do not appear yet to have drawn in any yolk-granules by the mouth, a deal of motion going on in the alimentary canal extending to the anal segment, which, at 9.15 a.m., was observed in one egg to have a motion of the anal flap, as of suction, opening and shutting. 11 a.m.: soon after this, tracheæ appeared in the retarded No. 2 egg, and ingestion of yolk-granules was first observed in the advanced ones, No. 1 especially, vigorously drawing them down at 12.30 and 1 p.m., with a deal of motion of the intestine, but granules do not appear to go further than end of crop, where they are in a continual bubbling state. This condition of things continued during the afternoon; pulsations not much increased, 8 to 12 per minute, but difficult to count from the other incessant internal motion. 7.30 p.m.: the hairs appearing faintly in the advanced ones. 9 p.m.: serous membrane traceable in most of the eggs, but

could not distinguish it in No. 1, the most forward, where nearly all the yolk is consumed, and the hairs can now be seen, springing up beyond where the attenuated membrane was, an hour or two since. 10.30 p.m.: the retarded No. 2 not begun to devour yolk yet, but the peculiar gaping movement of anal segment observable; the others all still busy swallowing the remains of yolk.

Twelfth day, 7 a.m.—No. 2 has *begun* to ingest yolk, the *others* pretty well devoured it all, but still a deal of wriggling motion with these, so as to make it difficult to distinguish pulsations fairly, counted several times, at 8 a.m. twenty beats per minute, at noon thirty beats per minute, at 4 p.m. thirty-five beats per minute, increased still more at 5.15 p.m., but the activity of the young larvæ was very great in their evident efforts to nibble the shell, which was at last accomplished, first by No. 7, exactly at 5.30 p.m.; before it was half out, No. 8 began, followed by Nos. 6, 4, 5, and 1, coming through so quickly that by 5.35 *all*, except the retarded No. 2, had escaped and commenced cleaning themselves and devouring their egg-shells. Eggs 3 and 9 were small and barren from the first.

And now I have a little tragedy to record. The unfortunate No. 2 was doomed to fall a victim to its tardiness; its brethren, when eating up their own egg-shells, made an opening in this No. 2, and I saw the air rush in, to the discomfort of the helpless tenant, not yet ready to avail itself of the opening made, consequently it was killed, literally torn to pieces by its comrades, who, finding this egg a more moist and dainty morsel than the other shells, set upon it, two or three at a time, and I actually saw one rise with a shred in its mandibles, and another raising its anterior segments, endeavouring to take it away: thus early fighting as it were over the remains of their less fortunate companion. It may be queried whether this would have happened under more natural conditions, but as young larvæ are well known to eat their egg-shells the first thing and to thrive the better for it, I am inclined to think that, at least with eggs deposited in this imbricated manner, it may occasionally happen. After witnessing this performance, I put a piece of a leaf of knapweed on the glass slide, still on the stage of the microscope, the larvæ soon found it, and at 6 p.m. I removed them to a jam pot containing some larvæ which had emerged a few days before, and established themselves on leaves of *Centaurea nigra*, making blotches from the under-side to the upper cuticle.

Ashford, Kent:

November 6th, 1886.

SUPPLEMENT TO ANNOTATED LIST OF BRITISH *ANTHOMYIIDÆ*.

BY R. H. MEADE.

Since the last portion of my List was published in October, 1883, I have found a few British species of *Anthomyiidæ* which appear to be new, and a considerable number of others which were unknown to me at the time of the compilation of my paper. I purpose, therefore, to go through the different genera into which the Family has been divided; shortly to describe those species which seem to be new; to record all additional ones which have come under my notice; to amend several errors into which I had fallen; and, finally, to add a few supplementary remarks, which may be of interest.

POLIETES, Rond.

The few species included in this genus resemble some of the true *Muscidae*, by having their bodies softer and less spinose than those of most of the other larger *Anthomyiidæ*; Rob. Desvoidy, therefore, placed them in his genus *Macrosoma*, between the genera *Graphomyia* and *Mesembrina*, but, as he afterwards acknowledged, this was a mistake, for the widely open extremity of the first posterior cell of the wing is an essential character of all Anthomids.

P. HIETICRURA, sp. n.

Mas, caeruleo-nigra nitida, parce tenuiterque setosa. Thorax vittis albidis striatus. Abdomen glauco-cinereum, linea dorsali nigra, tessellisque nigris signatum. Oculi longe hirti. Calyptra squamis aureis. Halteres obscuri. Alæ hyalinae, nervis transversis obliquis, sed rectis. Tibiæ posticæ arcuatae, dense villoso. *Long., 9 mm.*

Male, shining steel-blue; antennæ, palpi and legs black.

Head: eyes sub-contiguous, thickly clothed with long yellowish hairs; face with glistening white reflections; cheeks small and reddish-brown; mentum grey, thickly clothed with black hairs and bristles; vibrissæ extending about half way up the facial groove; antennæ rather short, third joint scarcely twice as long as the second; arista long, thickened at the base, thinly clothed with hairs of a moderate length to a little beyond the middle, extremity long and bare.

Thorax with *scutellum* shining blue-black; the former is marked with five silver-grey longitudinal stripes, which are very distinct at the sides and front margin, but become pale behind; they divide the dorsum into four blue-black bands, the outer pair of which are twice as wide as the inner pair; the dorsal bristles are small and weak, but the sides are furnished with numerous hairs and setæ.

Abdomen bluish-grey, showing white and black reflections; it is marked down the back with a longitudinal central black stripe, which is dilated into a large trian-

gular spot on the posterior margin of the second segment, and into a similar smaller one on the edge of the third ; there are very few bristles, except upon the sides and apex.

Wings hyaline, yellow at the root ; there is no costal spine ; the internal transverse veins are placed opposite the termination of the auxillary veins ; the external transverse veins are nearly straight, but placed obliquely.

Calyptra have yellow scales with bright orange margins.

Halteres small, with dull yellow stalks and grey heads.

Legs rather long ; middle tibia with a series of bristles of moderate and equal length along the whole of their external and posterior surfaces, and also with a number of long spines at their extremities ; hind femora clothed with long soft hairs ; hind tibiae distinctly curved towards their extremities, furnished with long hairs on the whole length of both their outer and inner sides, and with a series of spines on their posterior surfaces.

This species seems to be rare. I have only seen a single male, which I captured in August, 1883, in the Woods near Bolton Abbey, in Craven, Yorkshire. It bears a considerable resemblance to *P. albo-lineata*, but differs from it by being larger, by having four instead of two wide stripes upon the thorax, by the hind tibiae being curved and very hairy, as well as by other characters.

HYETODESIA, Mde.

H. TRIGONALIS, Meig.

This species, which is abundant in the Lake District about Windermere, as well as in the South of England, was recorded in my list under the name of *H. lata*, for which I mistook it. Mr. Verrall pointed out the error to me, and has recorded the name of the fly in his "Hundred New British Species of Diptera;" he includes it, however, in the genus *Spilogaster*, but the eyes are distinctly hairy (the cause of my mistake), therefore, it must be correctly placed among the *Hyetodesia*. It resembles *H. lata*, and also *Spilogaster fuscata*, by having a series of triangular black marks down the back of the abdomen. It differs from *H. lata* (which has not yet been recorded as British) by having, like *H. serva*, only three posterior dorsal bristles on the thorax in the two parallel rows of setæ which are placed in the space between the middle and lateral stripes, while there are four in *H. lata* ; the eyes of the male are also closer together (being contiguous) in *H. trigonalis* than in *H. lata*, in which they are only approximate ; the scutellum has two lateral black marks in the former, while there is only one basal mark in the latter ; the tibiae also are much lighter in colour in *H. trigonalis* than in *H. lata*. It may be at once distinguished from *S. fuscata* by the eyes being hairy.

H. BASALIS, Zett.

In the female of this species the eyes are almost bare, therefore, unless examined under a strong lens, it may easily be mistaken for the female of *Mydaea urbana*, which differs from the male in having the fore femora yellow like the posterior ones ; the former species may, however, be easily distinguished from the latter by the form of the epistome, which is much more prominent in *H. basalis* than in *M. urbana*.

H. SIMPLEX, Wied.

When I published my list I had only seen a single female of this rare species, which I captured near Edinburgh in August, 1875; in August last (1886), however, I found several males near Ulverston, Lancashire. It is a pretty, well-marked species. The hairs upon the eyes, as well as those of the arista, are short; there are only three posterior thoracic dorsal bristles, as in *H. serva* and *H. trigonalis*, and the first and second rings of the abdomen are red and translucent. Meigen described the male and female under different names, the former being his *A. posticata*, and the latter the *A. simplex* of Wiedemann. In his 7th and Supplementary Volume he places the latter in his genus *Aricia*, as having hairy eyes, whilst he puts the former among his *Hylemyia*, which have naked eyes. Both sexes are well described by Zetterstedt.

SPILOGASTER, Macq.

S. TETRASTIGMA, Meig.

This rare species was recorded as British and briefly described by Walker in the *Insects Britannica*, but I never saw a specimen until August last (1886), when I captured several males as well as females near Ulverston, Lancashire; the latter sex was previously unknown.

The male and also the female have the thorax marked with four longitudinal black stripes, the outer ones being broad, irregular in shape, and interrupted at the suture. There are only three dorsal bristles, behind the suture, between the middle and lateral stripes; the abdomen in the male is marked by four and sometimes by six dorsal spots, which are, in some specimens, rather indistinct; the female has the abdomen immaculate, and of an uniform pale grey colour; the antennæ are entirely black in the male, but have a more or less rufous tinge on the two first joints in the female; the palpi are black, with yellow roots, in both sexes; in the male the legs have the coxae, tarsi, bases, and proximal two-thirds of the upper surfaces of the fore femora, as well as the bases of the posterior femora, black, and the rest of the legs yellow; in the female the coxae, all the femora (except sometimes the bases of the fore pair), with the tibiae are yellow, and only the tarsi are black; the latter sex has also the posterior margin of the scutellum flavescent.

The female, which has evidently been overlooked, owing to the absence of the abdominal spots, bears a very close general resemblance to both those of *Mydæa impuncta* and *M. separata*; it may be known at once from the former by the colour of the palpi, which are entirely yellow in *M. impuncta*; from *M. separata* it may be distinguished by the arista being much longer haired, and by its having only three dorsal thoracic bristles behind the suture, while *M. separata* has four, as is also the case with *M. impuncta*.

S. PERTUSA, Meig.

This species has been recorded as British by Mr. Verrall, in his "Hundred New British Species of *Diptera*." I have not been so fortunate as to meet with an English specimen myself.

S. FLAGRIPES, Rond.

By mistake the name of this species was written *flagipes* in my list.

(To be continued).

NOTES ON *LEPIDOPTERA* IN SWITZERLAND IN 1885-86.

BY A. H. JONES.

I arrived at Saas-im-Grund in the Valais on the 22nd of July, 1885, where I met the Rev. J. C. W. Tasker and several other entomologists. Here I remained ten days, and I have a very pleasing recollection of the various excursions made in the neighbourhood.

The Saas Valley, like most of the lateral valleys of the Rhone, appears to be rich in *Lepidoptera*, especially in butterflies. The collecting ground commences at Stalden, the well-known halting station for visitors to Zermatt; from this point to the Mattmark See there is a difference in elevation of about 4200 feet, consequently a variety of species occur. After leaving Saas I spent a week in the Vallée des Ormonts, where I met with many species not taken in the Saas Valley.

In 1886 I spent the first week of June at Brunnen, on the Lake of Lucerne. In this well sheltered spot there appeared to be an abundance of insect life. The next point reached was Andermatt; here the weather was so bad that I had but little opportunity for collecting, yet, during the few intervals of sunshine, it was surprising to find so many butterflies on the wing; *P. Machaon*, for instance, was very abundant, and many other species were equally plentiful. I reached Zermatt at the end of June. The following is a list of species met with. I have added, as nearly as possible, the elevation at which they occurred. The elevations of the places often quoted are—

Brunnen	1434 feet.	Saas-im-Grund...	5125 feet.
Stalden.....	2736 "	Zermatt	5315 "
Andermatt	4738 "	Mattmark See ...	6965 "

Papilio Podalirius, not uncommon in the Saas Valley, up to 3000 feet. *P. Machaon*, very common and fine in meadows, Andermatt, up to 5000 feet, in June; second brood in the Saas Valley in July.

Parnassius Apollo, generally distributed and common, from 1500 to 5500 feet; more abundant at the end of July than in June. *P. Delius*, common in the Saas Valley, 5600 feet; more local than the preceding species, and does not appear to wander far from the streams where a species of *Saxifrage* (the food plant of the larva) grows; the butterfly was also common in the middle of June at Andermatt.

Aporia crataegi, one of the most abundant and generally distributed butterflies; very plentiful at Brunnen and in the Rhone Valley, but most abundant in the Saas Valley (up to 4000 feet); at Stalden it positively swarmed, and 20 or 30 specimens might be seen resting together on the muddy places in the path—June.

Pieris brassicae and *rapae* were common at Andermatt in June, and were identical with the specimens occurring in England. *P. napi* was also not uncommon; the

males were of the usual form, but the females were all of the variety *bryoniae*. *P. Callidice*, I found the males of this "mountain white" common on June 15th, flying over the Moraine (5751 feet), between the Rhone Glacier Hotel and the foot of the Rhone Glacier; the females were scarce. This species is quick on the wing and difficult to capture; it occasionally rested on the few low flowering plants on the Moraine, but had to be approached with great caution. This species seems to be somewhat local, for I only saw one other specimen, in a meadow at Zermatt.

Anthocharis Belia, var. *simplicia*, common, but worn, in the St. Nicola Valley, middle of June; at a thousand feet higher, however, in the Schmutt Valley, Zermatt, it was in very fine condition. *A. cardamines*, not uncommon at Zermatt in June.

Leucophasia sinapis, Saas Valley, June and August, up to 2800 feet, common.

Colias Phicomone, common, July 27th, in the meadows below Saas Fé Glacier, 6200 feet. *C. Hyale*, generally common in August, up to 4500 feet; very abundant in June.

Gonepteryx rhamni, a few at Stalden in June.

Thecla w-album, a few worn, at rest on *Umbelliferæ* in the Vallée des Ormonts, beginning of August. *T. rubi*, not uncommon, Zermatt, in June.

Polyommatus virgaureæ, var. *sermatensis*, in the greatest abundance at the end of July, Saas-im-Grund; females did not appear in any numbers until males were nearly over. *P. Hippothoë*, var. *Eurybia*, a few worn specimens end of July, Saas-im-Grund; this appears to be rather an early species, for I met with it in June both at Andermatt and Zermatt. *P. Alciphron*, var. *Gordius*, of this lovely species I took five specimens, three at Saas-im-Grund end of July, and two in the St. Nicolaus Valley end of June. *P. Dorilis*, rather common, Vallée des Ormonts, 3000 feet, beginning of August. *P. Phœas*, Brunnen, common but very worn, 1st June.

Of the "blues" I took nineteen species, viz.:—*Lycena Ægon*, very abundant, Brunnen, beginning of June. *L. Argus*, in profusion end of July, Saas Valley, up to 7000 feet. *L. Optilete*, a few very worn end of July, Saas Valley. *L. Baton*, one specimen at Stalden in June. *L. Pheretes*, *orbitulus*, and *Eros*, a few worn in the Saas Valley at 5200 feet, end of July; probably they were nearly over at this elevation, for at 7000 feet on the banks of the Mattmark See they were common and fine. *L. Astrarche* (*Agestis*), generally distributed, but never very common, occurring in June and July. *L. Icarus* (*Alexis*), Brunnen and Stalden, fairly common. *L. Eumedon*, common in Saas Valley, middle of June; Mattmark See, end of July. *L. Escheri*, one or two, Stalden, end of June. *L. Bellargus* (*Adonis*), very abundant at Brunnen, beginning of June. *L. Corydon*, common, Saas-im-Grund, end of July. *L. Hylas*, Vallée des Ormonts, 3700 feet, a few in August. *L. Damon*, very common, Vallée des Ormonts, 3000 feet, beginning of August. *L. Donzelii*, of this scarce "blue" I took a series at the end of July along the zig-zag path leading from Saas-im-Grund to Saas Fé. *L. minima* (*Alsus*), very abundant but worn, at Brunnen, beginning of June; very fine, middle of June, at Andermatt, about 3000 feet higher. *L. semiargus* (*Acis*), generally distributed and somewhat common, from 1500 to 5500 feet. *L. Arion*, a few at Brunnen, beginning of June, mostly worn; at higher elevations, viz., at Stalden and Zermatt, the species was represented by the form *obscura*.

Nemeobius Lucina, not uncommon at Brunnen, beginning of June.

Limenitis Camilla, not uncommon in the gardens at Lausanne, middle of July.

Grapta o-album, Hospenthal, 4800 feet, Valley of Usuren, a few also at Stalden in June.

Vanessa urticae, Andermatt, common in June. *V. Io*, Saas Valley, up to 5000 feet, August; larvae at Stalden in June. *V. Antiope*, I was surprised to meet with hibernated specimens of this species so late as the end of June, one at Zermatt and three at Stalden.

Melitaea Cynthia, the pupæ of this species were not uncommon on rocks at about 7000 feet, almost at the summit of the Furca Pass; I only bred two butterflies, ♂ and ♀, the remaining pupæ producing ichneumons; I also found a few of the full grown larvae. *M. Aurinia (Artemis)*, common, but worn, in June, at Brunnen, in swampy ground near the Lake of Lucerne. *M. Phæbe*, this fine species was common at Zermatt and Stalden, middle of June. *M. didyma*, one or two in beautiful condition, end of June, Stalden. *M. Dictyna*, common at Brunnen, flying in company with *M. Artemis*; also abundant at Stalden. *M. Athalia*, Stalden, common, middle of June. *M. Parthenie*, Brunnen, a little way up the mountain sides, also at Stalden; common in June.

Argynnis Euphrosyne, only met with at rather high elevations, viz., at Mattmark See and Andermatt. *A. Pales*, a very abundant species up to 7000 feet, in Saas Valley, end of July. At the latter elevation, the variety *Napæa* was not uncommon, I took one beautiful specimen (♀) almost uniformly blue-black. *A. Amathusia*, Diablerets, 3800 feet, end of July, common but worn. *A. Ino*, Diablerets, 3800 feet, end of July, common but worn. *A. Lathonia*, generally distributed and rather common up to about 5000 feet, in July and August; I took several wasted specimens at Zermatt in the middle of June. *A. Niobe* and var. *Eris*, both generally common in Saas Valley up to 6000 feet; at this elevation, at Saas Fé, the species swarmed at one particular spot, where also a very small form occurred not unfrequently. *A. Adippe*, common in the Vallée des Ormonts, August. *A. Paphia*, rather common, Sepey Road, near Aigle.

Melanargia Galatea, very common up to 2800 feet, Saas Valley, June and July.

Of the genus *Erebia* I took sixteen species:—*E. Epiphron*, var. *Nelamus*, a few in company with *E. Melampus*, which was very common and fine at Saas-im-Grund, end of July. *E. Mnestra*, a few from end of July, Saas Valley, 6600 feet. *E. Manto*, common and fine, Diablerets, 5000 feet, August. *E. Ceto*, very common in meadows, Zermatt, middle of June. *E. Medusa* and *Stygne*, at Brunnen, beginning of June. *E. lappona*, end of July, Mattmark See, two almost at the summit of the Furca Pass (at 7500 feet) on June 16th! *E. Evia*, Saas Valley and Zermatt, very common but worn, end of June. *E. glacialis*, this species occurred at about 6900 feet on a moraine immediately below the Mattmark See; there was absolutely not a trace of any vegetation, not even a blade of grass, on the moraine, yet the species was never taken away from it; it flew somewhat slowly, but was difficult to capture, owing to the rough nature of the ground, the specimens were obtained chiefly by waiting for them on the path which crossed the moraine; end of July. *E. Tyndarus*, a most abundant *Erebia* at Saas, end of July; one at Zermatt middle of June. *E. Gorge*, a few, end of July, Mattmark See. *E. Goante*, Saas Valley, up to about 5000 feet, end of July, common. *E. athiops (Blandina)*, Vallée des Ormonts, 4800 feet, very abundant, August. *E. Ligea*, a few worn, Vallée des Ormonts, in August. *E. Euryale*, a beautiful series, Zermatt and Stalden, end of June.

Eneis Aëlo, one at Schmutt Valley and two at Stalden, all rather worn, middle of June.

Satyrus Hermione, Stalden, common, end of June and July. *S. cordula*, in the greatest abundance, meadows, Sepey Road, Aigle.

Pararge Mæra, generally distributed and common up to about 4000 feet; the pretty green pupæ not uncommon under ledges of rocks.

Epinephela Lycaon, common, Saas-im-Grund, end of July. *E. Janira*, common, Saas Valley, up to about 3000 feet, June and July. *E. Hyperanthus*, common, Saas Valley, up to about 3000 feet, June and July.

Canonympha Satyriion, common at Saas and Zermatt, June and July. *C. Pamphilus*, common at Zermatt, end of June. *C. Tiphon*, Brunnen, one specimen (very like the Scotch form *Laëdion*) in a swamp near Lake of Lucerne.

Syrichthus carthami, two at Stalden, June. *S. alveus*, very abundant at Saas, end of July. *S. alveus*, var. *serratalæ*, Andermatt, June, very common. *S. var. cirsii*, Stalden, one or two. *S. Sao*, Vallée des Ormonts, in August; Brunnen and Andermatt in June, rather scarce. *S. malvæ*, very abundant, 7000 feet, Andermatt.

Nisoniades Tages, generally distributed, 2000 to 4000 feet.

Herperia lineola, *sylvanus* and *comma*, all rather common at Saas end of July.

Carterocephalus Palæmon (*Paniscus*), at Brunnen and Andermatt, scarce.

Macroglossa bombyliiformis, not uncommon at Brunnen, in swampy places, beginning of June. *M. fuciformis*, common in meadows at Andermatt, up to 5000 feet, middle of June.

Zygæna exulans, very common, Mattmark See, end of July.

Syntomis Phegea, one specimen, Stalden, June.

Setina aurita, very abundant, Saas Valley.

Callimorpha Hera, not uncommon, Stalden, end of July.

Acronycta rumicis, Zermatt, June.

Dianthæcia cæsia, two specimens at rest on rocks, Zermatt, June.

Acidalia ornata, Gœschenen, June.

Nyssia alpinaria, one, Rhone Valley, June.

Gnophos glaucinaria, Gœschenen, June.

Psodos quadrifaria, this pretty species was very abundant, at 6500 feet, at Andermatt, June.

Abraæas marginata, Gœschenen, June.

Cidaria turbata, Hospenthal, June. *C. rufiinctata*, Andermatt, June. *C. in-cultaria*, common, Andermatt, June. *C. hastata*, Zermatt, June. *C. berberata*, Zermatt, June.

Hercyna holosericalis, very abundant, Andermatt, 6000 feet, June. *H. alpestralis*, Zermatt, June.

Catastia marginea, var. *auricella*, Zermatt, June.

Botys nigralis, Zermatt, June. *B. lutealis*, Zermatt, June. *B. ærealis*, Zermatt, June.

Ancylosis cinnamomella, Zermatt, June.

Sciaphila Colquhounana or *Penziana*, apparently intermediate between two species, Zermatt, June.

Shrublands, Eltham, Kent :

November 17th, 1886.

Vanessa c-album.—On April 26th I caught a fine ♀ *V. c-album* flying over some currant bushes, and was fortunate enough to obtain a good many ova, which were all laid between April 27th and May 6th in the bright morning sunshine. The eggs hatched between May 5th and 11th, and the larvæ (fed on currant and nettle mixed) were full grown from June 17th to 23rd. The first butterfly emerged on June 26th, and the last on July 3rd, and all were very fine and of the pale summer variety. Two of the insects paired on June 30th, and the ♀ commenced laying on July 1st and continued doing so until the 10th, when there were 120 ova in all.

Unfortunately a spell of very cold weather began on July 12th, and more than half the eggs perished in consequence. The seven eggs laid last all hatched on July 15th, while a few of the earlier ones hatched at intervals till the 18th. The larvæ were divided, one lot fed on currant the other on nettle. The butterflies emerged from August 17th to 27th; those fed on currant were decidedly finer specimens, but all were considerably paler than the usual form. Several pairs were put together, but no ova were obtained. This beautiful butterfly has been common this year, and wild pupæ were found in July, August, September and October; several larvæ in the two last named months were found in the hop-yards by the pickers, the last butterfly from these appearing on October 27th.—E. HUTCHINSON, Kimbolton, Leominster: *December, 1886.*

On the flight and pairing of Hepialus hectus and humuli.—My attention was first drawn to this subject by an interesting note by Mr. Barrett (Ent. Mo. Mag., vol. xix, p. 90) on the odour emitted by the male of *H. hectus*. Dr. Chapman's earlier note on *H. humuli* had escaped my attention. Since then I have more than once seen the females of *H. hectus* fly to the males when the latter were oscillating in the manner common to this species and *humuli*, and I have not the least doubt that female *hectus* are attracted by the odour diffused by the males. The males fly pretty steadily backwards and forwards only a few inches above the herbage; the females have a curious tumbling, shuffling sort of flight, quite different to anything else I have seen. They shuffle about right up to the male, and the pair then retire to the herbage below. If boxed before pairing, the males are quiet enough, but the females flutter till they are quite unfit for the cabinet. Unimpregnated females deposit their ova quite readily in a chip box, and, rather to my surprise, I found these ova turn black. I had always thought the change of colour was a sign of fertility, but it is certainly not so with *hectus*.

I have frequently watched the oscillations of male *humuli*, and can confirm Dr. Chapman's observations in every particular. They fly considerably higher above the herbage than do *hectus*, and I had arrived at the same conclusions as he does, viz., that the female sees the male, and that he flies to show himself. If this be so, and I have no doubt about it, it probably accounts for the silvery brightness of the male. The variety *hethlandica* is said to "assume" the markings of the female, but it is much more likely that the sexes were originally alike, rather than that they have subsequently become so. If the female flies to the male by sight, the paler specimens would be better seen in the dusky twilight, and the tendency would be to the production of light coloured males, except in more northern latitudes, where the prolonged daylight would render the colour of less importance, and the production of light

coloured males would be a slower process. This theory accounts exactly for the various forms found in more northern latitudes. The difference between the flight of the female when ovipositing, and when seeking a mate, is most marked, and they fly much later in the evening when dropping their ova among the grass.—J. E. ROBSON, Hartlepool: *December*, 1886.

Mutilation in the process of transformation.—On September 9th, when looking into a box in which were pupæ of *Pterophorus acanthodactylus*, I noticed an imago lying flat on the bottom of the box, and apparently dead; on being touched, however, it showed signs of activity, and began to wriggle away to the best of its power. I then carefully examined it, and found, to my surprise, that, although fairly perfect in other respects, it was absolutely *legless*; nor was the mystery solved until I found the empty pupa case from which the moth had just emerged, and noticed the fractured ends of the six perfectly-formed legs protruding from it. All the legs were broken off near the thorax, at different joints.—EUSTACE R. BANKS, The Rectory, Corfe Castle: *December 3rd*, 1886.

Arctia mendica.—I would gladly learn if any entomologist who has bred or taken *A. mendica* in Ireland, has found the male differ in colour from the smoky-black form so familiar to English collectors?

In the summer of 1885 a kind correspondent sent me ova of the above species from Cork; they soon hatched, and the larvæ fed up quickly on dock and nettle. They were most voracious, requiring their cage replenished daily; this being neglected one busy day when the larvæ were nearly full fed, they ate their way through the calico, and nearly all escaped. The few larvæ remaining in the cage were taken good care of. Early in last April I received a letter from my kind correspondent telling me the same batch of ova he shared with me were producing him creamy and smoky-white males, and he wished to know if mine were coming out the same unusual colour. Mine did not emerge till fully a month later, but when they did so, the males were all creamy or smoky-white, and the females had very few spots of black on their wings, and were very different to any English ones I have ever seen. Eggs were obtained, and it is needless to say the larvæ were better taken care of this summer. The result is anxiously looked forward to.—E. S. HUTCHINSON, Grantsfield, Leominster: *December 13th*, 1886.

On the life-history of Nepticula headleyella, Stn., and of Phyllocnitis saligna, Zell.—The capture in June, 1885, of three specimens of the first brood, and in the following August of eight or nine of the second brood of the above-named pretty *Nepticula*, hitherto so scarce in collections (Ent. Mo. Mag., xxii, 257), gave me some hope of being able to find the larvæ in the autumn. This hope was realized in October. The life-history proved interesting, both on account of the peculiar habit of the larva, and also because, so far as I am aware, no species of *Nepticula* has been previously found to feed on any plant of the Natural Order *Labiatae*.

The egg seems to be laid on the upper surface of a leaf of *Prunella vulgaris*, generally near the mid-rib. The young larva makes a long and very narrow gallery

in the blade of this leaf, often running half-way, or even all round the edge of it, the frass forming a continuous dark central line. After a while, the larva bores down the petiole of the leaf and up that of another, sometimes the opposite one, sometimes one of those at the next node. This leaf, unless buried among long herbage, becomes of a dull purple colour, while the larva is tunnelling up its foot-stalk, owing, probably, to the interference with its sap-supplies hastening its ripening. Arrived at the blade of this leaf, the larva makes a wide blotch-like mine, often removing a great part, or even the whole of the parenchyma, unless the leaf be a very large one, when the mine takes the form of a broad zigzag gallery. Should the second leaf be very small, a third, or even a fourth, leaf may be mined. The frass forms a broad, broken, dark line in the middle of the mine. The full-fed larva is about two lines long; head very pale brown; body bright yellow; food showing through in the dorsal region as a long, dark green blotch. Cocoon dark brown, mussel-shaped, slightly keeled at larger end, rather flossy. The moths begin to appear at the end of May, and again towards the end of August, while the larvæ may be found at the end of July and beginning of August, and for the second time at the end of September, and almost throughout October.

It is, perhaps, worth noticing that the larva of *Phylloconistis saligna*, Zell., greatly resembles that of *Nepticula headleyella* in its way of travelling from leaf to leaf. The egg is laid near the mid-rib of a leaf of one of the smooth-leaved willows. The young larva mines the upper-side of the leaf, parallel with the mid-rib, sometimes for nearly its whole length; then bores down the petiole, and down the twig for an inch or more, turns round and mines up the twig for several inches, say, from four to eight, keeping the whole time just under the epidermis, then up the petiole of another leaf, in the under-side of which it makes a gallery of several inches' length before pupating in a little blotch at the edge of the leaf. I may add that the quickest way of finding the larvæ or pupæ is to search for the twigs with the bark mined.—W. H. B. FLETCHER, Fairlawn, Worthing: *December 13th, 1886.*

Nepticula desperatella, Frey (new to the British List), in Herefordshire.—Last June I bred three specimens of this unicolorous bronzy *Nepticula* from wild apple. Mr. Stainton kindly named it, and furnished me with the following quotation from Frey's *Tineen u. Pterophoren der Schweiz*, p. 374:—"The rather bright green larva occurs on wild apple trees in October, on quite young bushes, often in prodigious quantities—all the leaves appearing brown from the mines of these larvæ, of which I have found 12 or more in one leaf—though I have bred the insect freely, I have never seen a specimen of the imago at large."

I would add, that here the insect appears to be exclusively a woodland species, and at the same time very local, being confined to one large wood, where, among the older portions of the undergrowth it hunts up its scattered food-plant, following it quite to the boundary fence, and refusing to go further, though wild apple is plentiful enough in the adjoining hedges. The larvæ, which should be looked for from the middle to the end of September, occur in some quantities on the same bush, and are, therefore, easy to find, and would be still more so, had they not a special liking for the small inconspicuous shoots that grow close to the ground. The leaves on these low shoots are so small, or even minute, that they seldom contain more than

one larva, and I have not yet seen anything approaching the 12 or more in one leaf that Prof. Frey speaks of. The mine, at first a slender line running usually along the edge of the leaf for some distance, widens into a broad twisting gallery, in which the coils coalesce, and form a sort of false blotch.—JOHN H. WOOD, Tarrington, Ledbury: *December 15th, 1886.*

Scottish Coleoptera.—Having authenticated one record in Murray's "Coleoptera of Scotland," I must now proceed to relegate two others to the category of delenda. My excuse for not having done this sooner must be, that until within the last three or four years, I have not been working at *Coleoptera* for a long time. Certainly, *Malachius viridis* was never taken by me at Ormiston (p. 57), and the record must have arisen through some misapprehension on Murray's part. Nor did I ever (p. 49) take *Aphodius quadrimaculatus* on the Pentlands, or anywhere else in Scotland. The insects taken on the Pentlands, and which were recorded by Murray as *4-maculatus*, and mentioned by Hardy in the Catalogue of the Insects of Northumberland and Durham, under the name of *uliginosus*, were *putridus (borealis, Gyll.)*. I have, however, another of Murray's insects to substantiate as Scottish, viz., *Barypeithes brunnipes*, Ol., which occurs in a meadow in this neighbourhood, and also at Duddingston, where I took it more than thirty years ago. Dr. Sharp says, "I have not seen any individual found in Scotland of the species" (Scot. Nat., vol. v, p. 137).—R. F. LOGAN, Colinton, Midlothian: *December, 1886.*

Scarcity of Wasps.—The abundance of ♀ wasps (*Vespa* species) in the spring, and the scarcity of wasps in the autumn of this year, were both marked circumstances here, and the same facts were so general, that comment on them may be met with in papers and journals that do not usually notice such matters. In May plenty of the suspended nests of those species that build above ground were to be met with, but the weather of May and June were so unfavourable to wasp life by preventing the queen mother from foraging, that a wasp was a rare insect for the rest of the season, nearly all colonies perishing. Hive-bees suffered similarly, and it was not till July that a laying up of stores that should be largely done in May and June could be commenced. At the end of October I met with another illustration of the same conditions. On a bank of earth protected from rain by overhanging turf were the remains of many of the flagree tubes of *Odynerus spinipes*. If the nidification had been completed, portions of these should have been used to stop the mouths of the burrows: I found no burrows so stopped, and on excavating seven burrows I found three of them with only one *spinipes* cocoon at the bottom, and the other four empty. I went no further, not wishing to assist the extinction of an old favourite; I never before met with a *spinipes* colony where things had gone so disastrously.—T. A. CHAPMAN, Hereford: *November 13th, 1886.*

Review.

THE STRUCTURE AND LIFE-HISTORY OF THE COCKROACH: AN INTRODUCTION TO THE STUDY OF INSECTS. By Prof. L. C. MIAALL and ALFRED DENNY. Pp.

224, with numerous illustrations. London: Lovell Reeve, & Co.; Leeds: R. Jackson. 1886, 8vo.

Those who desire to be initiated into the anatomy and physiology of insects, cannot do better than study this instructive volume; it is clearly written in simple language, and the authors have evidently compared their own observations with the works of others. The Cockroach has always been a favourite insect with students of anatomy and physiology: partly on account of its abundance; partly on account of its form, which presents a broad surface on which to work; partly on account of its singular manner of oviposition; and partly on account of its primitive nature. While the book treats on the Cockroach in particular, it is, at the same time, a treatise on the comparative anatomy of insects in general. Objections might be raised as to certain pet theories being occasionally too strongly advocated, but the other side of the question is usually prominently put forward in such cases. The authors are careful to acknowledge the assistance they have received from Professors Plateau and Nusbaum on certain points they have specially studied, and a very useful chapter is the concluding one by Mr. Scudder, on the "Cockroach of the past:" these insects being amongst the few that have retained their leading characteristics from the earliest Palaeozoic times. We recommend this book to the notice of those of our younger entomologists who wish to know something about the *inside* as well as the *outside* of an insect.

THE SOUTH LONDON ENTOMOLOGICAL AND NATURAL HISTORY SOCIETY, Nov. 18th, 1886: R. ADKIN, Esq., F.E.S., President, in the Chair. Messrs. Blandford and Mullins were elected Members.

Mr. Billups exhibited *Prosopis punctulatissima*, Sm., taken at South Hayling, Jnne, 1886; he also exhibited two drawers of *Ichneumonidae*, showing a method of mounting and labelling, obviating the keeping of a journal. Mr. South showed varieties of *Lycæna Icarus*, *bellargus*, and *Corydon*, and remarked on their apparent significance.

December 2nd, 1886.—The President in the Chair. Mr. W. Farren, of Cambridge, was elected a Member.

Mr. Tutt exhibited long series of species of *Agrotis*, and, for comparison, on behalf of Mr. Russ, of Sligo, *A. cursoria*; also *Epunda lutulenta*, Bork., var. *sedii*, Gn., and var. *luneburgensis*, Frr. Mr. Wellman, *Satyrus Semele*, L., and *Lycæna Icarus*, Rott., from Ireland. Mr. Tugwell, insects from New Caledonia. Mr. South, *Lepidoptera* from the Amur Valley. Mr. Adkin, varieties of *Sarothripus undulanus*, Hb., from the New Forest. Dr. P. Rendall, *Noctua festiva*, Hb., var. *confusa*, Tr.; an interesting discussion then took place. Mr. Hall, a specimen of *Locusta viridissima*, found at sugar. Mr. Tugwell stated that this species was often to be found at sugar on the sand-hills at Deal, and he was of opinion it came to catch the insects, as he had seen it catch and devour large moths. Mr. Billups exhibited *Aleurodes vaporariorum*, Westw., from a greenhouse at Snaresbrook, Dec. 2nd, on leaves of Tomato.

The Annual Exhibition was held at the Bridge House Hotel, London Bridge, on November 25th, 1886, and over ninety members and friends were represented. During the evening about 1200 visitors attended. Among those exhibiting insects were:—Mr. McLachlan, Exotic *Neuroptera*, &c.; Mr. J. J. Weir, a series of *Argynnis Paphia*, L., and other *Argynnidae*, &c.; The Zoological Society, species of *Lepidoptera* reared in the gardens of the Society; Mr. Adkin, British *Pterophori*, *Tortrices*, &c., taken or bred during the year; Mr. W. Farren, *Bryophila impar*, Warren, varieties of *Acidalia rubiginata*, Hufn., &c.; Mr. L. Gibb, *Zygæna exulans*, Hoch., var. *subochracea*, White; Mr. Harwood, a variety of *Arctia villica*, L.; Mr. Murray, *Cidaria reticulata*, Hb.; Mr. South, his almost complete collection of British *Crambidae*, *Pterophoridae*, and *Pyralidae*; Dr. Rendall, British *Vanessa Antiopa*, L., *Laphygma exigua*, &c.; Mr. W. Warren, *Bryophila impar*, Warren, and forms of *B. perla*, Hb.; Mr. Jager, *Callimorpha Hera*, L., var. *lutescens*, Staud.; Mr. Shearwood, preserved larvæ and imagines of *Lepidoptera*; Mr. Wellman, British *Lepidoptera*; Mr. Williams, varieties of *Abraxas grossulariata*, L., &c.; Mr. Adye, *Chærocampa celerio*, L., interesting varieties of *Epinephele Janira*, L., and *Hemerophila abruptaria*, Thnb.; Mr. Anderson, life-histories of several species of wood-boring larvæ; Mr. Cooper, living *Phorodema smaragdaria*, Hb., &c.; Mr. Johnson, *P. smaragdaria* and *Erastria venustula*, Hb.; Mr. Elisha, British *Tineina*, the *Coleoptera* being especially noticeable; Mr. Goldthwaite, *Sphinx convolvuli*, L., &c.; Mr. Barclay, *Chærocampa celerio*, L.; *Pachetra leucophaea*, View., &c.; Mr. Knight, hybrids between *Smerinthus populi*, L., and *S. ocellatus*, L., &c.; Mr. Tugwell, British *Nocturni*, *Macroglossa* to *Setina*; Mr. Tutt, comparative series of species of *Agrotis*, also *Tephrosia crepuscularia*, Hb., and *T. biundularia*, Bork.; Mr. Williams, life-histories of British *Lepidoptera*, and a variety of *Pericallia syringaria*, L.; Mrs. Hutchinson, examples of three broods of *Vanessa c-album*, L., and a doubtful *Eupithecia*; Mr. Smith, a white variety of *Lasiocampa quercifolia*, L., &c.; Mr. Bliss, Exotic *Lepidoptera*; Mr. Sequeira, *Lepidoptera* from Central America; Mr. Edwards, exotic insects; Mr. Billups, British (and exotic) *Coleoptera*, *Hemiptera*, *Hymenoptera-Aculeata*, *Ichneumonidae*, and *Diptera*; Mr. Grut, exotic *Coleoptera*; Mr. Shaw, some recently captured British *Orthoptera*; Mr. West (Greenwich), British *Coleoptera*; Messrs. Carpenter, Hall, Levett, Ellison, Joy, Watson, Helps, Fremlin, Oldham, Hickling, McDonald, and others contributed.—
H. W. BARKER and W. A. PEARCE, *Hon. Secs.*

ENTOMOLOGICAL SOCIETY OF LONDON: December 1st, 1886.—ROBERT McLACHLAN, Esq., F.R.S., President, in the Chair.

Mr. W. H. Miskin, of Brisbane, Queensland (formerly a Subscriber), Mr. R. E. Salwey, of Folkestone, and Mr. F. W. Biddle, M.A., of Beckenham, were elected Fellows.

Mr. Howard Vaughan exhibited a long series of *Gnophos obscurata*, comprising specimens from various parts of Ireland, North Wales, Yorkshire, Berwick-on-Tweed, the New Forest, Folkestone, Lewes, and the Surrey hills, to show the variation of the species in connection with the Geological formations of the various localities whence the specimens were obtained.

Dr. Sharp showed a series of drawings of New Zealand *Coleoptera*, by Freiherr von Schlereth, remarkable for their delicacy and accuracy.

Mr. R. Adkin exhibited specimens of *Cidaria reticulata*, recently bred by Mr. H. Murray, of Carnforth, from larvae collected by him near Windermere, on *Impatiens noli-me-tangere*. Mr. Adkin said that as the food-plant was so extremely local, and, consequently, difficult for Mr. Murray to obtain, he had endeavoured to get the larvae to feed on some other species of balsam, but had not succeeded in doing so. Mr. E. B. Poulton observed that this statement tended to confirm the remarks he made at a recent meeting of the Society, on the subject of the habits of Lepidopterous larvae with reference to their food-plants.

Mr. Billups exhibited a number of living specimens of *Aleurodes vaporariorum*, Westw., obtained from a greenhouse at Snaresbrook, where they have caused great havoc amongst tomato-plants (*Lycopersicum esculentum*). He remarked that the species had been first figured and described by Prof. Westwood, in the "Gardener's Chronicle," 1856, and that attention had been recently called to it by Mr. Douglas (Ent. Mo. Mag. for December). Mr. J. Jenner Weir stated that plants in his greenhouse had been attacked by the same species.

Mr. Poulton exhibited the blood of a larva of *Smerinthus tiliæ*, and demonstrated, by means of a micro-spectroscope, the probable existence of chlorophyll therein.

Mr. G. T. Porritt exhibited forms of *Cidaria suffumata* from Huddersfield, including one very similar to that taken at Dover by Mr. Sydney Webb (Proc. Ent. Soc., 1886, p. xxv), and one still more extreme, having only the basal mark and the central stripe, with a slight streak at the tip, brown, the remainder of the wings being perfectly white. He also exhibited a series of small bilberry-fed *Hypsipetes elutata* from Huddersfield, showing green, red-brown, and black forms.

Mr. S. Stevens exhibited forms of *Campptogramma bilineata* and *Emmelesia albula* from the Shetland Isles, and a curious variety of *Chelonia Caja* from Norwich.

The Secretary read a letter from the Administrator-General of British Guiana, on the subject of the urticating properties possessed by the larvae and pupæ of certain species of *Lepidoptera* collected in Demerara.

Mr. McLachlan read "A Note concerning certain *Nemopteridae*."

Miss E. A. Ormerod communicated a paper "On the occurrence of the Hessian Fly (*Cecidomyia destructor*) in Great Britain." It appeared from this paper that there could be no longer any doubt as to the occurrence of the insect in this country, specimens obtained in Hertfordshire having been submitted to, and identified by Prof. Westwood, and by Mr. W. Saunders, of London, Ontario. Prof. Westwood said the specimens agreed exactly with Austrian specimens in his possession. A discussion followed the reading of this paper, in which the President, Mr. C. O. Waterhouse, Mr. Theodore Wood and others took part.

At the close of the Ordinary Meeting a Special Meeting was held for the purpose of considering certain proposed alterations in the Bye-Laws. The proposed alterations having been explained to the Meeting, were, after some discussion, agreed to, and the proceedings terminated.—H. Goss, *Secretary*.

HYMENOPTEROLOGICAL NOTES.

BY P. CAMERON, F.E.S.

I.--ON SOME NEW OR LITTLE-KNOWN BRITISH HYMENOPTERA.

NEMATUS OBLONGUS, Cam.

I believe this is *N. laricis*, Htg. The species varies not a little in form and coloration; and apparently, also, in the length of the antennæ. The form *oblongus* has the body shorter and broader than any of the continental specimens I have seen of *laricis*. I am not sure if the ♂ I have allotted to *oblongus* is really the ♂; Zaddach is the only author who describes the ♂ of *laricis*. All that he says about it is that the antennæ are laterally compressed and yellowish-brown beneath, and that the stigma is yellowish-brown.

The larva of *N. laricis* feeds on *Abies larix*.

NEMATUS PALLIPES, Fallén, sec. Thoms.

= *N. carinatus*, Htg, sec. Zad.

I am indebted to Mr. G. C. Champion for a specimen of this species taken by him at Aviemore, Inverness-shire. It comes nearest to *N. astutus* and *N. lativentris*, but differs from both in the legs and stigma being yellowish-testaceous; the hind femora are only slightly lined with black, and, in particular, the middle lobe of the mesonotum is U-shaped at the apex, not V-shaped as in the other species. *N. breadalbanensis*, Cam., is a narrower species than it; has the antennæ longer and thinner, the abdomen is longer, the femora and coxae are broadly black, the rest of the legs whitish, not reddish-testaceous, the spurs are shorter, and the transverse basal nervure is recurved nearer the middle of the cellule. The keel on the mesonotum is indistinct, and there is also an indistinct keel on the scutellum in my example of *pallipes*. The third cubital cellule is longer and more dilated at the apex than is *astutus*, and the wings are of a much more decided fulvous tint.

NEMATUS FAGI, Zad.

Schr. Ges. König., xvi, p. 295, taf. 5, f. 1.

On a beech hedge near my house here I found last July four larvæ of this species, and have succeeded in rearing three females from them. The imago does not appear to be distinguishable with any degree of certainty from *N. croceus*; but, as the larvæ are totally different, there can be no doubt of the two species being quite distinct.

NEMATUS LARICIVORUS, Zad.
Schr. Ges. König., xxiv, p. 147, taf. 1, f. 1e.

Black ; the labrum, palpi, tegulae, the pronotum at the tegulae and legs, white ; the coxae broadly at the base, the four anterior femora at the base, the posterior almost wholly, the apex of the hind tibiae and the hind tarsi entirely, black ; the orbits in front narrowly brownish, the antennae fulvous, blackish on the upper-side. Wings hyaline ; the costa and stigma yellowish-testaceous, the costa palest at the base, the stigma inclining to fuscous at the base. Antennae as long as the thorax and abdomen united, densely pilose ; slightly compressed ; the 3—5 joints sub-equal. Head covered with short greyish pile, distinctly punctured ; frontal area obsolete ; clypeus transverse. Thorax shortly pilose, opaque and punctured above ; a fine keel down the middle lobe of the mesonotum ; cenchri large, pallid. Abdomen shining, finely shagreened ; the last segment above with a Δ -shaped impression in the centre, enclosing a raised, somewhat pear-shaped, part. Cenchri longish. Legs covered with white pile ; claws apparently simple. The first cubital nervure is faint, the third cubital cellule a little wider than long, the second transverse cubital nervure received about its own length in front of it, transverse basal nervure received a little in front of the middle of the cellule ; the second cubital cellule has a horny point.

The ♀, according to Zaddach, has the antennae black, the coxae only black at the base, and the femora are less strongly marked with black. Length, 7 mm.

The femora want the reddish tinge so conspicuous on the femora of *appendiculatus* ; the vertex and front are much more strongly punctured, as is also the mesonotum ; the hind tarsi are entirely black, and the apex of the hind tibiae is more distinctly and uniformly so ; the third cubital cellule is shorter, and is not dilated at the apex, and the pubescence is darker.

Hab. : Plymouth (C. G. Bignell).

ÆGILIPS BICOLORATA, sp. n.

Black ; the antennae brownish beneath, striated, longer than the body ; the legs reddish-testaceous, the coxae blackish, claws fuscous. Wings hyaline, faintly smoky from the radial cellule. Thorax semi-opaque, the mesonotum finely transversely, the pronotum more strongly obliquely, striated ; mesopleurae shining, impunctate ; scutellum conical, in front rugosely reticulated, behind shining, faintly punctured ; metathorax rugose, the metanotum three-keeled, the middle one not reaching to the top. Petiole rugose, longer than broad. Parapsidal furrows faint, narrow, shallow. Abdomen shining. Radial cellule not much longer than broad. ♂.
Length, 2.5 mm.

Most nearly related to *Æ. striolata*, Cam. ; differing from it in the semi-opaque mesonotum, much narrower and shallower parapsidal furrows, by the mesonotum not having a furrow in the centre at the base, in the scutellar foveæ being much longer and deeper, in the scutellum being blunter and broader at the apex, in the rugose metathorax, in the reddish coloured legs, and by the radial cellule being shorter.

Probably from the London district.

II.—PARTHENOGENESIS IN *ERIOCAMPÀ ANNULIPES*.

During the past summer and autumn the larvæ of *Eriocampa annulipes* have been excessively abundant on some of the beech and hawthorn hedges round Sale; and have proved very destructive to them by eating the epidermis of the leaves. In one place in particular the leaves have had almost every particle of epidermis taken off, thus causing them to become curled up, and useless so far as being able to afford nourishment to the plant. Being so common, I thought that I would experiment to see if the species was parthenogenetic, like *E. ovata*, &c. I find that it is so, having bred males from virgin females.

Eriocampa annulipes has a wider range of food plants than any of the other species. It feeds on willows, birch, oak, lime, beech, and hawthorn.

III.—NOTE ON THE HYMENOPTERA OF THE HAWAIIAN ISLANDS.

I regret that, owing to my copy of De Saussure's "Etudes sur l. fam. d. Vespidæ" wanting some leaves (a fact I have only recently discovered), I have omitted in the paper by Mr. Blackburn and myself ("Memoirs of the Lit. and Phil. Soc. of Manchester," 1886) reference to two species of *Odynerus* described in that work (vol. iii, p. 289), namely, *O. nautarum* and *O. sandwichensis*. The former, I think, is identical with *O. insulicola*; the latter certainly = *O. rubritinctus*, Smith. The species described by De Saussure are in the British Museum.

I wish also to point out that *Tapinoma melanocephalum* is found in Australia, as well as in South America, *l. c. p. 234.*

Sale, Cheshire:

Nov. 15th, 1886.

LEPIDOPTERA ON CANNOCK CHASE.

BY CHAS. G. BARRETT, F.E.S.

I had the good fortune this year to spend the month of June in Staffordshire, and as my evenings were at my own disposal, it will readily be supposed that the fine wild district of Cannock Chase was not neglected.

For three weeks the wind was almost constantly cold, and sometimes very strong, and this *appeared* to be a great hardship, but in reality was almost an advantage, for although moths emerged slowly, they were hardy species, and *did* emerge, and were compelled to

shelter from the searching wind on the trunks of the trees, where it was easy to find them. When the weather changed, and became hot, collecting was decidedly more difficult and less productive.

A charming sight on the trunk of a large birch was a fine and perfect pair of *Leiocampa dictæoides*, and to a southener an occasional *Hadena glauca* was almost as interesting. I think that Cannock Chase must be nearly the southern limit of this species, it was far from common. Pretty reddish specimens of *Hadena contigua* also occurred, with *Acronycta leporina*, and, much more commonly, *A. rumicis*, pretty specimens with very black markings. The birch trunks swarmed with *Eudoreia ambigualis*—the largest I ever saw alive: as large, in fact, as *E. cembræ*—and these also were in many cases dark and strongly marked. *Eupæcilia nana*, which was also plentiful, had an odd trick of sitting on some projecting corner of the rough bark, where it looked precisely like a small bit of bird's dropping. The resemblance of *Halonota Pflugiana* to a larger deposit of the same material was strikingly exemplified in a specimen which had been driven by the rough wind to settle on an alder trunk. I did not suspect that it was an insect, but, puzzled by the straight sharp outline of the dorsal blotch, looked closer, and the supposed bit of bird's dung flew into my face.

The dead—but still standing—birches were infested with *Tinea fulvimitrella* and *cloacella*, the former evidently feeding under the bark, either on the rotten wood or the mycelia of fungi, to a considerable height, the latter usually close to the ground. The large, agaric-shaped, *Polypori*, which grew on these trees (and which probably bore a large share in their destruction), were not infested with any Lepidopterous larvæ, but the pupa skins of both these species of *Tinea* projected from the bark of the trees where other, smaller, fungi were growing. I have seldom seen more lovely insects than some of these *fulvimitrella*, just emerged, nestling in the chinks of the bark to avoid the wind, and prevented by the cold from taking off the gloss of their pristine beauty.

Three or four times I found, also on birches, a single specimen of *Œcophora stipella*, which also must here reach its most southern limit. The specimens were on living and dead trees, and so scarce that no conclusion could be formed as to their food and habits. The noble oaks which abounded along the crests of the hills produced very little. *Cidaria corylata* occurred on their trunks as well as on those of birches, and were of large size and great beauty of colour and markings. One grand oak had been split into three great fragments by lightning, one

portion was still standing and in full vigour of life, another lay at full length like a fallen tree of considerable size, rather than a branch, and the third, falling in another direction, had split and half crushed a smaller oak near it. At the edge of the split in the trunk of this smaller oak I found a fine specimen of the curious form of *corylata*, in which the central band is wanting. The vast limb which had fallen on this tree was the resort of numbers of *Eupithecia castigata*, some of them very dark and curious, and *Capua ochraceana* was more than usually common about it, while the other great fallen limb already mentioned, which had not only been struck down, but actually *burnt out* by the lightning, seemed to be a favourite resting place for *Geometræ*, and even *Hadena contigua*. In its degree this old tree looked almost as massive a ruin as many an old castle, and the abundance of insect life under its protection was very curious. From another large oak trunk I obtained a very large specimen of *Cidaria russata*, which was nearly black. Extraordinary to relate, this species was *very scarce*, I only saw one other specimen.

Among *Vaccinium myrtillus* under the trees *Phoxopteryx myrtillana* abounded, very pretty and rather variable, and for numbers, amazing! Early in the month, *Incurvaria masculella* also occurred, though not very commonly, among the *Vaccinium*. Its presence there was perplexing, there certainly being no hawthorn near.* Equally curious was the occurrence, on the hill tops, of *Thecla rubi*, flitting about the *Vaccinium*, sucking the flowers, and resting on the leaves when the sun was obscured. (This was an error in judgment, for the green of its under-side did not match that of the *Vaccinium*, and the little butterfly became thereby conspicuous.) No broom or *Genista* was to be found anywhere near, nor any plant on which it could reasonably be supposed to feed in the larva state. In *very* sheltered places *Nepticula myrtillella* was sometimes to be found, and among the heather *Pleurota bicostella*, sometimes very large, and, at the end of the month, rather abundant.

In the fir woods *Fidonia piniaria* was, of course, abundant, and interesting from the intermixture there, as in Derbyshire, of the southern cream-coloured males and orange females, with the white males and brown females of the north. On the alders in the swampy valleys well marked varieties of *Hypsipetes impluviata* and *Melanippe substristata* were to be found, and on one occasion a most beautiful black variety of *Cymatophora duplaris* fell from a branch of one of

* I have found *Incurvaria* cases commonly amongst *Vaccinium myrtillus* at Pitlochry, but did not know to which of the species they belonged.—H. T. S.

these trees in response to the beating stick. *Eupisteria hepatica* also flew among them or settled on the ground, and *Adela Sulzella* and *Degeerella, Argyrolepis cnicana*, and the red form of *Eulia ministrana* occasionally occurred. *Hepialus velleda* must have been common to judge by the wings dropped by the bats and lying on the ground, but I could not stay late enough on any evening to see them—trains not permitting. One day, however, the wind was so furious that *velleda* was fairly compelled to shelter in the spacious chambers formed by the spreading roots of large beeches, a tolerably eloquent tribute to the force of the wind.

On the last visit to the Chase I experienced a disappointment. I was proceeding in the early dusk over one of the barest hills towards the station, when I noticed some small moths flying among tufts of *Nardus stricta* and other wiry grasses, but not being able to see very well, took them for *Gelechia terrella*. To make sure, however, I boxed one specimen, and found it to be *Gelechia politella*.

King's Lynn, Norfolk :

August 17th, 1886.

THE LEPIDOPTERA OF THE BIRMINGHAM DISTRICT.

BY W. G. BLATCH.

In the November (1886) number of the Ent. Mo. Mag. appeared a contribution by W. Harcourt Bath, entitled, "Notes on the *Lepidoptera* of the Birmingham District: a Retrospect."

Mr. Bath's leading idea seems to be that great changes are rapidly taking place in the forms and distribution of plants and insects in the Midlands, and that the Birmingham district offers a specially favourable field to the student of nature, inasmuch as he can there see clear and numerous signs of the extinction of certain species, and their replacement by others. If this were true, it would indeed be an interesting fact, and every true naturalist would eagerly turn his attention to a locality in which such peculiar conditions were so strongly marked.

But what is the character of the evidence adduced by Mr. Bath in support of his contention? With the single exception of *Lycaena semiargus* (which formerly occurred in the district, and now seems to have disappeared), there is not a particle of reliable confirmatory evidence in the long array of "examples" he gives in illustration of his argument.

It would occupy too much space to deal with all the details of

the paper in question, and I fancy many of them will not be thought to require notice. Such changes in the fauna and flora as he refers to are not peculiar to the Birmingham district, and are certainly in some cases more imaginary than real. All species are liable to fluctuation, some more than others, abundant one season, scarce another; but these variations are well known and pretty fully recorded. In his introductory matter, Mr. Bath takes a great deal of trouble to prove what every entomologist already knows, and one might feel amused by his laboured paragraphs were it not for his servility to one small word by means of which he rings the "changes" *ad nauseam*. It would be interesting to learn from Mr. Bath what "lists of fifty years ago" he refers to, and in what respect they differ materially from the lists of to-day. Bricks and mortar have, indeed, crowded out a few things from the limited areas affected, but surely it is unfair to attribute this to climatic changes, and the gradual conversion of the forms of one geological period into those of another!

Will Mr. Bath be good enough to disclose his authority for the statement that "not many years ago *Papilio Machaon* used to roam throughout the Midlands?" Would he be surprised to learn that *Apatura Iris* still occurs in several woods in Warwickshire? And will he pardon me for informing him that the "pabulum" of the Purple Emperor larva is not "oak," but "sallow?"* I am glad to say that *Melanargia Galatea* still occurs near Knowle, and is abundant at Salford Priors, Henley in Arden, and in other parts of Warwickshire and Worcestershire.

The mention of *Lycæna Corydon* is very unhappy: there is, indeed, a record of this butterfly having been on one occasion taken at Knowle, but, even if the fact were indisputable, no one except Mr. Bath would jump to the conclusion that the specimen was a natural product of the district. *Argynnis Dia*, and other favourites of Mr. Weaver, must be put down in the same category, and we shall require clearer evidence of their claim to be considered natives of the locality—and, indeed, of their alleged capture in it—before we can accept the story. From what I can gather, it would be rash and indiscreet to a degree to pin one's entomological faith to "that energetic collector, the late Mr. Weaver."

It may be true that "the three large Fritillaries—*Argynnis Aglaia*, *A. Paphia*, and *A. Adippe*—used to occur not uncommonly in Sutton Park about thirty or forty years ago," and that they now appear to be extinct or nearly so, but they are plentiful in other parts of the Bir-

mingham district, and their absence from one small spot does not, it seems to me, affect the general question. As to the common blue, *Lycœna Icarus*, being extinct, or even scarce, in Sutton Park, that is sheer nonsense: I see it there every season, and only last June I captured a fine series in that identical locality, for the purpose of renewing my sets.

Lycœna Argiolus is not confined to Sutton Park, as Mr. Bath declares it to be: it still occurs at Bromsgrove Lickey, Coventry, and some other places near Birmingham.

Gonopteryx rhamni has not yet forsaken Sutton Park, and is not likely to do so I should say, judging from the number of larvæ I saw there during last season feeding on the Buckthorn (*Rhamnus frangula*), which is plentiful in most of the woods. *Vanessa Io*, *Pararge Megæra*, *Epinephele Janira*, &c., are likewise neither extinct nor rare in the same locality, nor, indeed, in any other part of the Birmingham district, as I can vouch from personal observation. *Saturnia pavonia* still flies at Sutton, and the larvæ may be found by any one who takes the trouble to hunt it up at the proper season: it may not occur in equal abundance every year, but that is all that can be truthfully said about it. *Colias Edusa* and *C. Hyale* are never more than casual visitors here, and do not occur more frequently now than in former years. The history of their appearance is in no way connected with local conditions, and, however glad we may feel when they deign to come amongst us, we cannot regard them otherwise than as erratic strangers.

Notwithstanding Mr. Bath's statement, I must say, as a local entomologist of nearly twenty years' standing, that I know of no evidence that would lead me to believe that *Acherontia Atropos* and *Acronycta alni* are less rare in this district at the present time than formerly.

The fluctuations in the appearance of *Vanessa cardui*, *Plusia gamma*, &c., are, I fancy, not unknown to observers, and it seems odd to drag these species in as evidence of great changes going on in the district.

If Mr. Bath will become a student of entomology, on the lines he himself lays down in his concluding sentences, he will probably be more accurate and logical in his next contribution.

214, Green Lane, Smallheath,
Birmingham:
December, 1886.

[Mr. Bath's paper, when accepted, was supposed to be a retrospect of his own experiences.—EDS.]

ON THE CASES, &c., OF *OXYETHIRA COSTALIS*, CURT., AND
ANOTHER OF THE HYDROPTILIDÆ.

BY KENNETH J. MORTON.

At page 17 of the present volume, Mr. McLachlan has recorded the breeding of *Oxyethira costalis*, Curt., and in a few words sketched the more salient characters of its interesting case. He then suggested that I should give further details from materials which he had kindly sent me on more than one occasion. I shall endeavour to do so now; and I take the present opportunity to call attention to another Hydroptilid case communicated by him, which, I believe, also came originally from Mr. Bolton, of Birmingham.

The transparency of the case of *O. costalis* has been noticed. It is so perfectly hyaline, that sometimes the larva appears as if crawling about without any case at all, until suddenly some change of position brings it into view, but this colourless transparency becomes slightly lessened with age, as extraneous matter gets attached to the sides. Speaking broadly, the case may be called wedge-shaped, or triangular in contour. In the place of what would be the extreme thin end of the wedge there is a circular opening with everted margin, the mouth-end of the case; this part is apparently of firm consistency, and firm seams run along the two sides of the triangle. From the mouth backwards the walls become more and more compressed, until towards the posterior end they meet, and apparently unite in the middle, but remain open at either side in a valve-like slit. This curious structure appears to be altogether composed of the larva's silken secretion; when seen with a $\frac{1}{2}$ -inch objective, multitudes of small oval bodies (diatoms) are found to be present, but I am uncertain whether these are actually incorporated with the substance of the case, or simply casually adherent to its outer and inner surfaces. The length is $2\frac{1}{2}$ mm.; breadth at tail end $1\frac{1}{2}$ mm.; this example is not quite of full size.

The larva carries the case with the flat posterior end perpendicular to the surface over which it is moving. It spins web freely, and soon fills a small vessel full of fine threads, along which it wanders about. The head of the larva is rather large in proportion to the size of the three transverse chitinous thoracic segments, and is provided with well developed antennæ; the two posterior pairs of legs are long, with very long and slender tarsal claws; and the body is of the usual obese Hydroptilid form.

Fritz Müller's description of the case of *Lagenopsyche*, a Brazilian

genus, agrees so well with that of *O. costalis*, that I quote part of what he says:—"An approximate idea of the case may be formed by imagining the bottom of a bottle to be cut away, and then its under part to be compressed until the opposite sides touch each other, thus transforming the wide circular opening into a narrow slit. The mouth of the bottle represents the mouth-end of the larval case, and the long narrow slit at the tail-end is held in an upright position. * * * For transformation the case is placed on one of its broad sides, and then fixed on either side of each end by petiolated discs. * * * After having fixed its case, the larva turns its head towards the broader end of it, so that the mouth-end of the larval case becomes the tail-end of the pupa case."*

Unfortunately, my larvæ of *O. costalis* all died before they spun up. I do not doubt, however, that the change of position above indicated takes place, and the case is known to be fixed in the same way (*vide ante*, p. 17).

I am indebted to Mr. McLachlan for bringing before me a paper (with a plate) by Mr. G. V. Hudson on the transformations of a New Zealand species of *Hydroptilidae*.† The larva and case bear some resemblance to those of *O. costalis*, but the case has a decided shoulder, and there is no everted rim. No mention is made of how the case is carried ; the figure suggests that it is trailed on the flat surface. The alteration in position when the nymph stage is reached is noticed, as well as the spinning of an arch-shaped partition towards the broad end.

The second form of case to which I referred may belong to *Orthotrichia angustella*. I bred the insect, but the last ecdysis was not quite complete, and the difficulty of an exact determination was enhanced by the specimen being a ♀. While this case does not share the transparency of that of *O. costalis*, or even that of *Agraylea*, it is not opaque ; the colour is greenish, the middle of the back mixed with brownish matter. Form tubular ; ventral surface plane, dorsal gently arched ; at either end (when viewed dorsally or ventrally) a large triangular excision is seen, and this is unquestionably the strong character of the case ; the apices of the triangles are connected by a suture-like line, and the brownish dorsal part has a striated appearance. When about to change, the larva fills up the triangles, produces the sides into concave plates, and closes with silk.

Head and thoracic segments of larva chitinous, narrow, of about equal breadth ; head elongate-oval ; prothorax almost quadrate ; next

* Trans. Ent. Soc. London, 1879, p. 142.

† Trans. N. Z. Institute, vol. xviii, pp. 213-4.

two segments transverse, metathorax rounded posteriorly. These segments are all yellowish, the thoracic segments margined with black. Legs, first pair short, others of moderate and about equal length. Abdomen with first segment narrow, the rest of body very stout, green. This larva has prominent antennæ, and the eyes appear to be larger than usual.

I hope the question as to the maker of this case will soon be set at rest.

At present our knowledge of the cases of European *Hydroptilidae* appears to be limited to the following, viz.: the three forms mentioned by Pictet (which require further elucidation); *Stactobia* (Mon. Rev. Eur. Trichop., p. 516); *Agraylea*, *Oxyethira*, and *Orthotrichia* (?).*

Carluke, N.B.:

November, 1886.

DESCRIPTIONS OF FOUR NEW SPECIES OF LYCAENIDÆ.

BY HAMILTON H. DRUCE, F.E.S.

JAMIDES PETUNIA, *n. sp.*

♂. *Upper-side*.—Allied to *J. Woodfordii*, but differs in that the wings are a glossy slate-green colour, instead of ultramarine blue.

Under-side: markings as in *J. Woodfordii*, but the whitish lines not nearly so distinct.

The black margins on upper-side are about intermediate between *J. Woodfordii* and *J. campanulata*.

Expanse, as *J. Woodfordii*. *Hab.* : Fiji Islands; Mus. Druce.

This species is interesting as being the only one of the colour in the group. The four specimens I have seen do not vary in colour.

NACADUBA DEXAMENE, *n. sp.*

♂. *Upper-side*: primaries and secondaries dull violet-blue, with distinctly lighter coloured margins, cilia light brown.

Under-side brownish-grey, with darker markings edged with white. Primaries with several dots along the costal margin, an oval spot in the middle of the cell, and a spot curved outwards at the end, beyond which (also curved outwards) is an irregular band of spots, terminating at the lower median nervule, thus leaving a considerable space without a mark, and beyond this a marginal row of inwardly curved lunules. Secondaries with several irregular markings beyond the base, and beyond these a band of broken markings running parallel with a marginal row of triangular lunules, the two anal lunules with distinct black centres.

* A short note by me on a larva and case, which, probably, belong to what we know as *Hydroptila sparsa*, appeared in this Magazine, vol. iv, p. 17 (June, 1867). The larvae made opaque oval flattened cases, and concealed themselves in the crevices of stones at the bottom of the stream; I remarked that they were able to suspend themselves by a thread in the water, after the manner of Lepidopterous larvae in the air.—R. McLACHLAN.

♀. *Upper-side*: primaries dull greyish-brown, with the base suffused with light blue. Secondaries a somewhat lighter colour than primaries, with a few bluish hairs near base.

Under-side, as in ♂, but ground-colour lighter. Thorax, abdomen, and legs blackish; antennæ black, with white rings; palpi greyish and black tips.

Expanse, $\frac{1}{8}$ in.— $1\frac{1}{8}$ in. *Hab.*: Delagoa Bay, E. Africa (Mrs. Monteiro).

There is a species in the B. Museum unnamed, closely allied, from Lake Nyassa.

NACADUBA GEMMATA, n. sp.

♂. *Upper-side*: primaries and secondaries a uniform, dull greyish, silky blue, very narrowly and evenly bordered with brown; cilia greyish.

Under-side greyish-brown, with irregular transverse bands bordered with greyish-white, both wings suffused with black at base. Primaries with a band from the costal nervure to the inner margin, running through the middle of the cell (which band is continued across the secondaries to about the middle of the inner margin); a large oblong spot at the end of the cell, and beyond, at about half the distance between the spot and the posterior margin, runs, curved outwards, a distinct irregular band from the costa to just beyond the middle of the inner margin, and beyond that a marginal row of elongated lunules, curved inwards. Secondaries with three distinct irregular bands, the 1st as referred to above, the 2nd and 3rd at about equal distances from themselves and the 1st, commencing at the costa, running into one beyond the middle, and reaching the inner margin; next a zigzag line, and beyond, commencing at the apex, a row of three indistinct brown dots, followed by two large, orange-bordered, silvery-green ocelli, with black centres, and a silvery-green spot at anal angle. There are no tails to this species.

♀. *Upper-side*: primaries greyish-brown, suffused with glossy sky-blue from base to just beyond the cell. Secondaries greyish-brown, with a dark spot on the posterior margin near the anal angle.

Under-side, same as ♂, except that bases are not suffused with black. Head, thorax, palpi, and legs blackish. Antennæ black, ringed with white.

Expanse, ♂, $\frac{1}{8}$ —1 in.; ♀, $\frac{1}{8}$ — $\frac{9}{16}$ in. *Hab.*: Fiji Islands; Mus. Druce and B. M.

This species is remarkable for the size of the ocelli on hind-wing below, and is not closely allied to any known to me. Among some dozen specimens before me there is no variation except in size.

DEUDORIX ODANA, n. sp.

♂. *Upper-side*: both wings a uniform dark purple-brown, excepting the anal margin, which is brownish; cilia of fore-wing brown, of hind-wing white, except the apex, which is brownish; the lobe is black, thickly speckled with silvery-green scales, bordered outwardly with dark copper. Thorax and abdomen greenish-brown.

Under-side greenish-brown, with an oblong spot—bordered with white—at the end of the cell, and a transverse band curved outwards beyond; there is also a faint greyish line along the outer margin. Secondaries marked as in *D. Galathaea*, except—

ing that the transverse band is far more irregular and not so distinct. Antennæ white, ringed with black and white tips beneath; legs white, palpi white with black tips.

Expanse, 1½ in. *Hab.* : Cameroon Mts., W. Africa (Fuller); Mus. Druce.

This species, although allied to *D. Galathea*, may be at once distinguished by the entire absence of red on the posterior margin of upper-side of secondaries. When held in some lights, both wings are suffused with brilliant blue, which closely resembles some species of *Thaumantis*.

London: *January*, 1887.

LIST OF BRITISH *TIPULIDÆ*, &c. ("DADDY-LONGLEGS"),
WITH NOTES.

BY G. H. VERRALL, F.E.S.

(Continued from page 160).

Rhamphidia longirostris, Mg.: I expect there has been only one European species described under the three names of *R. longirostris*, *inornata*, and *flava*; Walker sinks *flava* as a synonym of *inornata* in his "Notes on *Diptera*" (1874). I took it freely at Lymington in June, 1885, and a few this year near Tunbridge Wells.

Orimarga virgo, Ztt.: this important addition to the British list occurred on a little grassy slope against the river Torrigill at Inchnamph in Sutherland, on July 20th & 21st last. It is a very remarkable *Mantis*-like species, exceedingly frail and feeble, and very slow in its movements. I think it must be *O. virgo*, Zetterstedt, Dipt. Skan., x, 3896, though in one ♀ the base of the cubital and the cross vein below are not in a line, and in all the specimens the small cross vein joins the stem of the discal even more before the first fork than in *O. anomala*, Mik., Wien., ent. Zeit., ii, 198, still the large cross vein is after the middle of the discal cell, and the tips of the femora and tibiæ are determinately dark.

Antocha opalizans, O.-S.: in very great abundance in the valley of the Shin last July.

MOLOPHILUS.

1 (8) More or less ochreous, alar expanse, 9–12 mm.

2 (7) Yellowish-ochreous, abdomen mostly ochreous.

3 (4) Gen. ♂ with four long thin black processes.....*appendiculatus*, Stæg.

4 (3) Gen. ♂ with two short black processes, or none.

5 (6) Gen. ♂ with broad upper lamellæ, blunt at upper outer angle, and bearing a hook at lower angle; beneath gen. two shortish black processes... *propinquus*, Egger.

6 (5) Gen. ♂ with upper lamellæ narrowish, and armed at upper outer angle with a small hook, no black processes beneath *ochraceus*, Mg.

7 (2) Brownish-ochreous; gen. ♂ with two very long sickle-shaped black processes *bifilatus*, Ver.

8 (1) Black to blackish-brown or grey, alar expanse, 6 mm. or less.

9 (12) Knob of halteres whitish.

10 (11) Deep black species; wings of male abbreviated *ater*, Mg.

11 (10) Blackish-grey species *obscurus*, Mg.

12 (9) Knob of halteres blackish *murinus*, Mg.

The species of the first group are very similar, and difficult to distinguish, except by the male appendages; there are, however, minute distinctions which may be of assistance in determining them: I am also not very certain about their nomenclature.

M. ochraceus, Mg.: by this name I recognise a yellow species of which the upper lamella of the male genitalia is very long and simple, rather narrow, and bearing minute black hooks at the end; there seems to be no lower lamella, but a long yellow middle piece; the frons is yellow, with a brownish dash on the middle; the joints of the antennæ are roundish; the wings are yellow. To me it is the rarest of the four species, but I have stray specimens from Penzance, Lyndhurst, and Wicken.

M. appendiculatus, Staeg.: if I have only one species under this, I am quite satisfied that it is correctly named; the upper lamellæ of the male genitalia are small, and bear at the upper inner angle a longish process, and at the lower inner angle one pair of short black hooks; there is a long narrow process below shorter than in the following species; the lower lamellæ seem large, and bear at the end a very long, curved, thin, black hook below, between the two long black sickle-shaped processes, thus there appear to be four nearly equal long black processes; it is the yellowest and smallest of all the species, the frons is yellow and the abdomen scarcely at all obscure above; the wings are yellow. I have it from numerous localities in Devon, Hants, Sussex, Kent, Suffolk, Cambridge, and Sutherland.

M. propinquus, Egger: under this name I place a reddish-yellow species, with the abdomen obscure above; the upper lamellæ of the male genitalia are broad and blunt, almost square, at their upper inner angles a little produced towards each other so as usually to touch there, at their lower inner angles are short black-pointed hooks, close

to these hooks but more inward and more concealed are two more black hooks, and beneath the lamellæ are two longish, black, thin, sickle-shaped processes (not nearly so long as in *M. bifilatus*) ; lower lamellæ long and narrow ; antennæ all yellowish, joints oval, verticils short ; frons blackish-grey, wings smoky-yellowish. This species is common, and I have taken it in Hants, Sussex, Kent, Cambridge, Isle of Arran, and at Loch Maree.

M. bifilatus, Ver. : since I described this in last February's number of this Magazine (vol. xxii, p. 199), I have frequently met with it, and am somewhat more suspicious that it may be Meigen's *M. griseus*, as it is much less ochreous than the others, it is also decidedly the largest. I have only caught it in Hants, Cambridge, and Suffolk (my own garden), but believe it is quite common.

RHYPHOLOPHUS.

- 1 (6) Last vein straight, short ; joints of male antennæ petiolate.
- 2 (5) Brownish-grey.
- 3 (4) Thorax with a central dark line *lineatus*, Mg.
- 4 (3) Thorax not striped *nodulosus*, Mcq.
- 5 (2) Ochreous *similis*, Stæg.
- 6 (1) Last vein sinuated, long ; joints of male antennæ ovate.
- 7 (8) Thorax with four tolerably distinct stripes, the middle two uniting behind ; wings considerably mottled *varius*, Mg.
- 8 (7) Thorax indistinctly striped ; wings less mottled *hæmorrhoidalis*, Ztt.

Three of the above species I added to our lists last January, and I took them again last summer ; *R. varius* was abundant at Princetown, Dartmoor, and *R. similis* I met with rarely near Inverness and Inveran, it is a pretty, very distinct species.

This genus requires considerably more study ; we have certainly two common species under *R. nodulosus*, but which is Macquart's species I do not know ; then there is the species I mentioned last February which Mr. Cooke sent me as *Erioptera varia*, but which has the last vein straight and short ; and on June 4th, 1886, I caught at Frant one female of a large species with a discal cell, probably *R. pentagonalis* of Loew, but I could not find more, though I closely searched.

ERIOPTERA.

The six species in my list divide themselves into two groups, the first four being wholly or largely ochreous, while the last two are greyish or blackish ; of the ochreous species *E. macrophthalmia*, Lw., now first recorded as British, is a large yellow species with black palpi and large eyes, its abdomen is longer and narrower than that of

E. flavescens, L., the knobs of the halteres are dark brown above, the tarsi, especially the hindmost, whitish-yellow, and the male genitalia with yellow hooks only a little tinged with brown. It was not at all uncommon last June near Tunbridge Wells, but I unfortunately did not then suspect its being distinct from *E. flavescens*, L. Loew described it in 1871 from Silesia, and had seen one specimen from St. Petersburgh.

E. flavescens, L., is also all yellowish, but the palpi are darkened yellowish, never approaching black, the abdomen is shorter and thicker, and the hooks on the male genitalia black or blackened at their ends; I have taken it from Lymington to Inveran.

E. lutea, Mg., I do not clearly know, it is smaller and darker than *E. flavescens*, and with greyer wings; I believe I possess it, but my specimens are in very bad condition.

E. tænionota, Mg., is a very common and widely spread species, but as no continental writer seems to clearly recognise it, I append the following notes. It is smaller than *E. flavescens*, the middle of the thorax is brown, often almost blackish, forming a continuous line up to the very base of the antennæ; if this middle line becomes very dark or broad, indistinct side lines begin to appear, and in one male I possess the whole central disc of the thorax might be described as blackish, leaving the sides ochreous and the pleuræ yellow (in this specimen the upper-side of the abdomen is also all brownish); the *collare* is whitish; the antennæ all dirty-yellowish, if bent back not quite reaching the scutellum, the joints elongate, bearing on one side a hair considerably longer than the joint itself; frons ochreous, dusky on the middle; knob of halteres blackish. The two forks on the wing nearly equal, or the lower one a little the shorter, the last vein very much twisted. The male genitalia yellow, the lamellæ long and rather narrow, intercrossing at ends with blackish toothed hooks. I have met with it from Bickleigh Vale to Inchnadamph, the specimens from Inchnadamph being very dark on the thorax and the three lines coalescing; it is abundant about a sort of sewage drain in a paddock near my house, and specimens were brought me once which were literally crowded together by hundreds on the under-side of a stone opening into a sewer.

Beyond these four there is certainly another British species with a curiously forked end to the hooks on the male genitalia, but I have never yet found it in abundance, and have failed to identify it with any described species.

Of the grey or black species, *E. fuscipennis*, Mg., is the smaller and blacker, and has the veins hairy all their length, while *E. trivialis*, Mg., has them hairy only on their ends. *E. trivialis* is very near the genus *Symplecta* but for these hairy ends to the veins, and I have seen it sometimes have a dark cloud crossing from near the end of the sub-costal vein to the upper branch of the radial, resembling the supernumerary cross vein of *S. punctipennis*, Mg., only placed between different veins. Both species are common, and I have seen *E. fuscipennis* from Penzance to Tongue (I could not go much further), and *E. trivialis* from Lewes to Inchnadampf.

Lipsothrix errans, Wlk. : I have no doubt about the synonymy of this species, and, in accordance with Loew's doubt (Bes., Eur. Dipt., iii, 69), I can remark, that out of eleven specimens only one male has quite black knees ; this specimen seems rather small, and with legs rather short and thin, but I do not think it distinct : others have the knees a little darkened. The species is at first glance so remarkably like the large yellow *Erioptera* or *Dicranomyia*, that I have no doubt it is often overlooked, but its very distinct neuration at once identifies it. I have taken it at Lyndhurst, Rotherfield and Wadhurst in Sussex, and Inveran in Sutherland.

(To be continued).

Note on the genus Eudectus.—Through the kindness of Herr Weise I have recently received an example of *Eudectus Giraudi*, Redt., and as I have just now before me the only example of *Eudectus rufulus*, Weise, found by Mr. Lewis in Japan, I have taken the opportunity to compare these examples with the unique specimen of our British *E. Whitei*. As the result of this comparison, I think all three should at present stand in the Catalogue of *Coleoptera* as distinct species. The differences in colour between the three are very marked ; but as *E. Giraudi* is known to be variable in this respect, they may be considered to be of minor importance, and would be insufficient to substantiate the species if there were no other differences. Other differences are, however, numerous. *E. Giraudi* is larger than either of the other two insects, and is specially remarkable by the great development of the angular sides of the thorax, and the three conspicuous depressions on the disc of this part. In *E. Whitei* the thorax is much narrower, the angulation of the sides only slight, and the three discoidal impressions are obsolete. In *E. rufulus* the angulation of the sides can scarcely be seen, and the discoidal impressions are absent. *E. Giraudi* has the vertex of the head more densely punctured than it is in the Japanese and Scotch insects.

If these distinctions prove constant, the three insects are readily enough distinguished ; but it is probable that other localities will yield specimens connecting them. At present they are all extremely rare, and are each restricted to widely

separated habitats, Japan and the mountains of Scotland and Silesia; it may be taken for nearly certain, therefore, that *Eudectes* will be discovered in Siberia, and if so, I expect that all three forms will be connected.

Herr Weise made a journey from Berlin to Glatz to find *E. Giraudi*, and secured nearly a dozen examples; he informs me that it is a bark insect like *Coryphium*, whereas *E. Whitei* was found under a stone on the summit of a high mountain, but has not again been met with. Probably a Coleopterist working the old trees at the foot of Ben a Bhuid or other of the high mountains in the heart of the Grampians may be fortunate enough to meet with it.—D. SHARP, Southampton: *January*, 1887.

Chrysomela cerealis, &c., on Snowdon.—Ever since reading the record of the capture of *Chrysomela cerealis* on Snowdon by Mr. Champion (Ent. Mo. Mag., Sept., 1875) I have had a great desire to find this beautiful species in its habitat. Not until last summer, however, had I the opportunity of putting my desire into effect, and even then I felt that a journey to Snowdon for *cerealis* in August was a mistake. Nevertheless, by dint of most persistent work, my friend Mr. Wilding was at last successful in finding two specimens (either under one stone, or under two stones very close together), but though we searched most energetically, these were all that could be found. This year I made up my mind to spend a holiday on Snowdon in June, the time when the insect was taken by Mr. Champion, and I left home for this holiday, accompanied by my wife, on Saturday, June 26th. Travelling via Menai Bridge and Carnarvon we reached Llanberis in the evening, and found apartments (which I am extremely pleased to recommend to any intending visitors to this delightful district) at Cambrian Lodge. Mrs. Parry, our hostess, was so very obliging in various matters so necessary to an entomologist, and her charges so moderate, that I feel it necessary to repay her for her kindness by recommending her cottage to my friends.

The following morning we started for Snowdon, of course ignoring the many offers of guidance, and searched most carefully in any likely spot for our principal desideratum. No, no *cerealis*! although the day was just such as one could expect a *Chrysomela* to delight in. *Aphodius lapporum* was abundant in sheep dung, the red form (? immature), prevailing to a much greater degree than during last August. *Nebria Gyllenhalii* was common, but not nearly so abundant as on a previous visit. We found three specimens only of *Pterostichus aethiops*, a few *Patrobus assimilis*, a few *Corymbites cupreus*, var. *arruginosus* (all females), a single specimen of *Bembidion bruxellense* by one of the streams, and a single *Anthophagus alpinus* (?).

Tuesday passed in another careful search for *cerealis*, though I spent an hour or so beating the larches, &c., in the plantation through which the path leads. Here *Dascillus cervinus* was abundant, together with *Telephorus pellucidus*, *T. nigricans*, *T. alpinus* (a few), and other common species of the genus. Working in the streams below the path I found *Elmis aeneus* in its usual situation, and *Agabus guttatus*, but no *Geodromicus globulicollis* where we had before taken it. We again met with one or two *Pterostichus aethiops*, and a single *Carabus catenulatus* was the only member of the genus found on Snowdon (another of the same species Mrs. Ellis found near the waterfall of Ceunant Mawr). I met with a single specimen of *Corymbites tessellatus*, sitting on a rush, and we took both type and variety of *C. cupreus*, which, in Cwm Brwynog at least, seems to be partial to the *Lycopodium selago*.

Wednesday was a complete failure, for though we walked through the Pass of Llanberis to Pen-y-pass Inn, and ascended Snowdon from thence, descending to Llanberis in the evening, the day was so dreadfully hot, that everything in the way of herbage, moss, &c., was burnt up, even large stones lying in the sunshine being too hot to touch. By the roadside in the Pass I picked up another *Corymbites tessellatus*, and among shingle on the bank of the stream which comes down from Cwm Glas I found a single *Homalota* which I believe to be *planifrons*.

On Thursday I started alone, and after four hours' hard searching, and hard work it was in the intensely hot sun, I at last dropped across a single *cerealis*. Only an enthusiastic entomologist can imagine my feelings when, in a moment more, there appeared, nearly in the same spot, a pair *in copula*, and then more until I had bottled what I thought were 20, but which proved to be only 17, all collected from a spot where there was very little thyme, and not more than a dozen paces square. The collection of these took nearly four hours, and there was not another to be found anywhere near.

On Thursday we felt too tired to attempt another day at *cerealis*, so walked across the mountains, the road lying between Moel Goch and Moel Cinghorion, to Snowdon Ranger, a walk of four miles only, but one which commands some of the finest scenery in the neighbourhood. Here, as on Snowdon itself, everything was scorched up with the intense heat, and no beetles were to be found.

Friday found us again on the spot where we had previously taken *cerealis*, but only a single specimen turned up. After a considerable ramble I happened, fortunately, to spy another individual at some distance from the other locality, and setting to work, I found the species again, this time in greater number, but still very local in their distribution, all occurring on a sloping bank where there was a profusion of wild thyme, but only a few square yards in extent. There I took also *Pterostichus ethiops* running in the hot sun. I most fully endorse Mr. Champion's remark that *cerealis* is "a beautiful object when crawling about in the sunshine." The individuals are easily seen when exposed, but they have a habit of "dodging" in and out of the herbage, so that one has to keep a sharp look out, and to pounce at once on the slightest twinkle of their exquisitely coloured elytra. They seem to be most plentiful about 2 p.m., when they are frequently seen *in copula*, but they require the hottest sunshine to bring them out, indeed, so hot was the bank on which they occurred, that it was quite uncomfortable to sit down upon. I was fortunate in this excursion to hit exactly the time of their emergence from the pupal condition, for not only were several of the specimens taken quite soft, but also we found no remains of dead specimens in the nests, beneath stones, of the very numerous and apparently well-fed spiders which abound on these slopes, and which, to judge of what remained of their meals, had dined freely upon everything else in the beetle line that we had come across in our travels.

I may mention, that throughout our various excursions, we found *Crambus furcatellus* common at any elevation above 1500 feet, but owing to my mistaking it at the time for *C. margaritellus*, I did not secure more than about half-a-dozen. Thoroughly satisfied with our hot but very successful holiday, we left for Llandudno on Saturday morning.—JOHN W. ELLIS, Brougham Terrace, Liverpool.

An Entomological trip to Sherwood Forest—With the double purpose of seeking healthful recreation in the enjoyment of sylvan scenery, and adding to our knowledge and collections of *Coleoptera*, we paid a visit, extending over eleven days, to "Merrie Sherwood" in the middle of last October. The previous experience of one of us was useful in settling a list of the species to be specially sought, nor were we far wrong in our calculations, for, with the single exception of *Teredus nitidus* (which positively declined to come to the front), we were fortunate enough to secure all the species bargained for, as well as a good few not on our programme.

During the first two or three days the rain fell almost incessantly, and we had to do our hunting in waterproof attire; but afterwards fairly fine weather favoured us, and we indulged in mutual congratulations on our good fortune. Our joy was, however, of short duration, for the midges ("jaspers" as they are called locally) became so troublesome as to render collecting (if not impossible) certainly very distressing, and after fully debating the question of the relative advantages of fine weather *versus* wet weather collecting, the vote went decidedly in favour of the latter. We found plenty of logs in the woods, although they were often difficult to "spot" owing to the luxuriant growth of bracken, and every day we discovered more fallen timber in excellent condition for the bark-knife than could be profitably dealt with, and were compelled to pass over much of it untouched; this we did with a mingled feeling of regret for our limited time and powers, and a benevolent satisfaction that we were leaving material for future explorers.

Standing trees, however decayed, and there were plenty of such, were absolutely unproductive, except when harbouring fungi, and then the fungus and not the tree was the source of profit.

Under the bark of logs and stumps (the remains of oak, birch, pine, beech, and a few other trees) in various stages of decay, we captured *Scydmaenus Godarti*, *S. collaris*, *S. exilis*, *Eutheia clavata* (oak and birch), *Bythinus Curtisi*, *Batriscus venustus*, *Euplectus punctatus*, *E. Karsteni*, *E. nanus*, *E. nigricans*, *E. bicolor*, *E. nubigena* (?), *Oculea castanea*, *Oxypoda incrassata*, *O. haemorrhoa*, *Homalota aquata*, *H. linearis*, *H. pilicornis* (?), *H. immersa*, *H. xanthoptera*, *H. xanthopus*, *Placusa pumilio*, *P. denticulata* (?), *Cilea silphoides*, *Megacronus cingulatus*, *Mycetoporus lucidus*, *M. lepidus*, *Quedius cruentus*, *Q. xanthopus*, *Q. scitus*, *Q. nigriceps*, *Philonthus splendidulus* (commonly), *Xantholinus punctulatus*, *Coryphium angusticolle*, *Homalium pusillum*, *H. punctipenne*, *H. iopterum*, *H. concinnum*, *H. nigrum* (var. of *H. florale*), *Phlaecharis subtilissima*, *Ptinella testacea*, *P. denticollis*, *P. aptera*, *P. angustula*, *Pteryx suturalis*, *Cerylon angustatum*, *Plegaderus dissectus*, *Ips quadriguttatus*, *Agathidium nigripenne*, *A. seminulum*, *A. nigrinum* (one specimen also taken flying), *Rhizophagus depressus*, *R. cibratus*, *R. ferrugineus*, *R. nitidulus*, *R. dispar*, also several of a black variety of *R. bipustulatus* simulating *R. politus* exactly in colour, and a few examples of a *Rhizophagus* new to Britain, it is near *nitidulus* and *dispar*, but quite distinct from either; besides these occurred *Thymalus limbatus*, *Scaphisoma agaricinum*, *S. boleti*, *Scaphidium quadrimaculatum*, *Triphyllus punctatus*, *T. suturalis*, *Elater pomorum* (birch), *Rhagium bifasciatum*, *Tetratomia Desmaresti* (?), *Orchesia undulata* (which, fortunately, was not so skippish as in the summer months), *Trypodendron domesticum*, *T. quercus* (?); *Phlaeotrya Stephensii* (dead) was every now and then turned out of burrows in the solid wood, which we fondly hoped would produce something more desirable.

In fungi on old trees and stumps (oak and birch) we found *Agaricochara lavigollis*, *Oligota apicata*, *Mycoetophagus piceus*, *Cis hispidus*, *C. bidentatus*, *C. nitidus*, *C. fuscatus*, *C. festivus*, *Heledona agricola*, *Tetratoma fungorum*. A very diminutive Hymenopterous insect turned up in some numbers in a white fungus on birch, which we brought home in our pockets; *Cis fuscatus* occurred abundantly in all stages of maturity in the same fungus; possibly, therefore, the Hymenopteron is parasitic on the *Cis*, but Mr. Saunders, to whom it was sent for identification, has not yet reported.

The fungi growing in the soil were not as well tenanted by beetles as might have been expected, and we were therefore obliged to be content with the following species: *Homalota xanthoptera*, *H. aeneicollis*, *H. ignobilis*, *H. boletobia*, *H. humeralis*, *H. marcida*, *H. muscorum*, *Quedius puncticollis*, *Q. lateralis*, *Cychramus luteus* and *C. fungicola* (in company), and *Cryptophagus lycoperdi*.

In carrion (dead sheep, hedgehog, moles and birds) we found *Oxypoda spectabilis* (1), *O. lividipennis*, *Aleochara mæta*, *Homalota fungivora*, *H. gagatina*, *H. divisa*, *H. indubia*, *H. nigricornis*, *H. ravilla*, *H. corvina*, *H. sericea*, and another species, possibly *H. cribrata*, *Tricophya pilicornis*, *Philonthus cephalotes*, *Stilicus orbiculatus*, *Choleva tristis*, *C. grandicollis*, *C. Kirbyi*, *C. chrysomeloides*, *C. fumata*, *C. Watsoni*, *Carcinops 14-striata* (2), *Corynetes ruficollis*, and *C. rufipes*.

In straw heaps, placed by the keepers in various parts of the forest for the benefit of the pheasants, but which we did not work seriously for want of time, we captured *Homalota fungivora*, *H. ravilla*, *H. corvina*, *H. atricola*, *H. canescens*, *H. germana*, *H. parva*, *Oligota inflata*, *O. pusillima*, *Conurus lividus*, *Stilicus orbiculatus*, *Homalium fossulatum*, *H. cæcum*, and *Choleva velox*.

When resting and eating our frugal lunch the fallow deer which are in the enclosures, pert squirrels, and other animated objects, interested us much, as lovers of nature, by their curious ways and apparent tameness.—W. G. BLATCH, 214, Green Lane, Smallheath, Birmingham; A. C. HORNER, Tonbridge, Kent: December, 1886.

Captures of local Hemiptera.—During the last two seasons I have captured the following species, which, being usually accounted scarce, appear to be worthy of record. *Lopus sulcatus*, early in July, near Fareham, Hants, by sweeping over waste ground; abundant. *Lopus flavomarginatus*, at the same time and place; scarce, I obtained only three. *Corixa Wollastoni* and *Gerris Costæ*, in pools about Llyn Idwoll, North Wales, in August.—HORACE FRANCIS, 8, Church Terrace, Lee, Kent: December 31st, 1886.

Anosia Plexippus (Danais Archippus) at Shanklin.—I have a butterfly, taken at Shanklin, Isle of Wight, which I believe is unknown to British collectors. Not mentioned in Newman's, or Coleman's, or Morris's, or Wood's works on entomology. The insect measures at least 4½ inches across, is of a bright Vandyke brown with black markings, similar to Black Veined White (*Aporia crataegi*), and has a white and spotted black edge to each wing, with deep black line on inner margin; body is black, with white spots on thorax; is in splendid condition, seemingly fresh from chrysalis.—J. A. BILLINGS.

[The above notice appeared originally in the "Hampshire Independent," for December 18th, 1886, a cutting from which has been obligingly forwarded to us by

the Editor. There can be no doubt that it refers to *Anosia Plexippus*, the migratory butterfly of which so many occurrences on our shores have lately been recorded.—[Eds.]

Parasites on the genus Coleophora.—I have bred the following *Hymenoptera* from larvæ of the above genus—*Limneria volubilis*, Holm., from *C. albicosta*; *L. Elishæ*, Bridgman, from *C. flaviginella*, Lienig; and *Tetrastichus eudemus*, Walk., from *C. trifolii*, Curt.—C. W. DALE, Glanville's Wootton : December 20th, 1886.

Query respecting Aporia cratagi.—Is this butterfly still found in the south-eastern counties of England, as it is almost the only one of which I do not see captures recorded in the Magazines?—ID. : December 30th, 1886.

[We have no reason to doubt that this butterfly still occurs in its usual numbers in the district between Herne Bay and Canterbury. We shall be glad of information if such be not the case.—Eds.]

On the flight and pairing of Hepialus sylvinus and lupulinus.—I was fortunate enough this year to witness the manner in which *H. sylvinus* pairs, and, though the observation is a solitary one, I think it conclusive that the female attracts the male, and feel sure future observations will confirm this. I had sugared some posts on the railway side, and was wandering about in the twilight, looking for nothing in particular, when my attention was drawn to a large moth fluttering in a peculiar manner on a stem of grass: it seemed as though it were trying to escape from something that held it fast; thinking some large spider, or other predaceous creature, had hold of it, I lit my lantern, and then saw it was sitting on the stem vibrating its wings with such rapidity that I could not possibly see what the species was. I watched it closely, and presently a small moth, unheeding the glare of my lantern, flew to it. I needed to be very quick to secure it before they paired. The vibratory motion of the wings of the sitting moth ceased as soon as the other touched it, and I saw it was an extra large female *sylvinus*. For nearly ten minutes she remained motionless, then after a preliminary flutter or two, the motion of the wings recommenced, and presently another male flew up: this time they were too quick for me, and the pairing was accomplished. Following up the clue afforded by Mr. Barrett's observation, I have no hesitation in concluding, though my olfactory nerves were not sensitive enough to detect the scent, there in the open air, that an attractive odour was emanating from the female which the vibratory motion of her wings was assisting to disseminate. *Sylvinus* is easily taken *in cop.*, sitting after dark on the herbage. To confirm the above observation, they should be looked for before dark, for the female evidently never stirs from the place where she emerges.

I have never seen *H. velleda* pair, but a correspondent informs me that he has seen a female, when newly emerged, dragging her long abdomen along the surface of the ground, seeking some stem on which to hang till her wings expanded, but even then attended by a number of males. This would seem to be attraction of the ordinary kind, but as the species is generally very abundant where it occurs, it might not be difficult to watch the whole process.

The males of *H. lupulinus* fly just above the top of the herbage. Their flight is swift, but very erratic, and quite different to that of any other of the genus. Like

that of the others, it only lasts a comparatively short time, and there is no doubt they are then seeking the females. The species swarms here, and the males may be seen in scores, careering along just before dusk, but though it is so abundant, and though I have watched them repeatedly, I never saw them pair. Possibly the females diffuse an odour as I suppose the female of *sylvinus* does, but if it be so, they certainly do not expose themselves in the way the female *sylvinus* mentioned above did. It may, however, be that some mode of attraction, different to those already known, obtains with *lupulinus*, for of the three species first named, of which I can speak with any certainty from what I have seen myself, quite different habits are found. The males of *H. hectus* fly while diffusing an odour to attract the females. The females of *H. sylvinus* sit while probably doing the same thing to attract the males; while the male of *H. humuli* undoubtedly attract the opposite sex by its light colour being easily seen as it vibrates to and fro in the twilight. It is curious, too, that the same mode of flight should be adopted by two species, while the actual means of attraction is so different, as in *hectus* and *humuli*. It would be interesting to know what are the habits of other species occurring elsewhere. Have any such been recorded?—JOHN E. ROBSON, Hartlepool: December 7th, 1886.

[In the Pyrenees there exists a species of *Hepialus* (*H. pyrenaicus*, Donzel) of which the ♂ is somewhat similar to that of *H. lupulinus*, but of which the ♀ is nearly apterous, and utterly incapable of flight. But any collector so fortunate as to obtain a virgin ♀ can secure as many ♂ as he may desire. They "assemble" just as in the case of certain *Bombyces*, &c. Possibly some correspondent in New Zealand, Chili, &c., can enlighten us as to the behaviour of the gigantic *Hepialidae* there found.—Eds.]

Review.

THE LEPIDOPTERA OF SUSSEX.—List of *Lepidoptera* observed in West Sussex. By W. H. B. FLETCHER, M.A., F.E.S. (Transactions of the Chichester and West Sussex Natural History Society, No. 5, new series, 1886). List of the *Macro-Lepidoptera* of East Sussex. By J. H. A. JENNER, F.E.S. (Proceedings of the Eastbourne Natural History Society, 1885—86).

Sussex has always been a county having the advantage of possessing numerous resident entomologists, centered especially in Lewes, Brighton, Hastings, and Worthing. The Hastings contingent have published two useful Lists of the Insects of the district, already noticed in our pages. The two Lists now before us are of great local value; but it is scarcely possible to compare one with the other on account of the differing conditions. Mr. Fletcher's predilections are (as every one knows) especially on the side of *Micro-Lepidoptera*, and he enumerates over 400 species of those, and only about 250 species of *Macro-Lepidoptera*, amongst which we find no mention of *Sterrhia sacraria* (cf. Trans. Ent. Soc., ser. 3, vol. ii, 1866). The *Tineina* are greatly elaborated; there are no less than 32 species of *Nepticula*, 16 of *Lithocleitis*, 29 of *Coleophora*, and so on in proportion. Mr. Jenner, on the contrary, has not yet attempted to enumerate the *Micros*, but he catalogues 627 species of *Macros*, with special indications for the five divisions into which the river-system of East Sussex resolves itself. He has the advantage of being able to include the well-

worked Hastings district in his List. It is convenient to notice these two Lists under one heading, but from special circumstances it is impossible to make any further comparison that would be of service. Each has its value in differing directions.

Obituary.

Jules Lichtenstein.—It is with great regret we announce the decease, on the 30th November last, at Montpellier, of this well-known entomologist, at the age of 68. In the summer of last year he had a paralytic stroke, but no immediate danger was anticipated. To the readers of this Magazine his name will have become familiar by the numerous papers and notes he published in its pages on the habits of *Aphides*, *Cynipidae*, *Tenthredinidae*, &c., always written in English, and printed almost as written: indeed, it is probable he was at one time resident in England. Lichtenstein was, we think, a descendant of the old German naturalist of that name, who published much in many departments of Natural History, and whose earlier writings appeared in the Transactions of the Linnean Society of London. The subject of this notice was a vineyard-proprietor, and his entomological energies seem to have been especially aroused by the appearance of the *Phylloxera*, when he was about 50 years of age. Since that time, and down to his illness, he was a most industrious worker and observer of phytophagous insects generally, with great originality of deduction. Probably we may again have occasion to refer to his labours when more precise data as to his early life come to hand. This short notice is scarcely a fitting tribute to the memory of a man so thoroughly *sci: generis* in all his writings.

ENTOMOLOGICAL SOCIETY OF LONDON: ANNIVERSARY MEETING, January 19th, 1887.—ROBERT McLACHLAN, Esq., F.R.S., President, in the Chair.

An Abstract of the Treasurer's Accounts was read by Mr. Stainton, one of the Auditors; and the Secretary read the Report of the Council, which was received and adopted.

The following gentlemen were appointed to serve as Officers and Members of Council for 1887:—President, Dr. David Sharp, F.Z.S.; Treasurer, Mr. Edward Saunders, F.L.S.; Secretaries, Mr. Herbert Goss, F.L.S., and the Rev. W. W. Fowler, M.A., F.L.S.; Librarian, Mr. Ferdinand Grut, F.L.S.; and as other Members of Council: Messrs. Robert McLachlan, F.R.S.; Gervase Mathew, R.N., F.L.S.; George T. Porritt, F.L.S.; Edward B. Poulton, M.A., F.G.S.; Osbert Salvin, M.A., F.R.S.; Henry T. Stainton, F.R.S.; Samuel Stevens, F.L.S.; and J. Jenner Weir, F.L.S.

The retiring President delivered an address, and a vote of thanks to him was moved by Mr. E. B. Poulton, seconded by Prof. Meldola, and carried.

A vote of thanks to the Treasurer, Secretaries, and Librarian was moved by Mr. McLachlan, seconded by Mr. Stainton, and carried; and Mr. Goss and Mr. Grut replied.

A vote of thanks to the Council was proposed by Mr. Waterhouse, seconded by Mr. White, and carried.—H. Goss, *Hon. Sec.*

IS *APORIA CRATAEGI* EXTINCT IN ENGLAND?

BY HERBERT GOSS, F.L.S.

Mr. Dale's enquiry in the February number of this Magazine, as to the occurrence at the present day of *Aporia crataegi* in the south-east of England, induces me to raise the question of whether this species is dying out, not only in the south-east, but in all parts of this country. During the last ten years it has, to my knowledge, disappeared from all the localities in the New Forest, and in Monmouthshire, where it was formerly found in abundance.

The counties in which *Aporia crataegi* formerly occurred, and from all of which it has, apparently, now disappeared, are Kent, Sussex, Hampshire, Huntingdonshire, Northamptonshire, Herefordshire, Monmouthshire, and Glamorganshire. I do not say that the species has never been taken in other southern, western, and midland counties; but those above named are the counties where the species most regularly and constantly occurred.

KENT.—It is well known that less than thirty years ago this species was plentiful in various parts of this county, especially about Wye, Ashford, Strood, Rochester, and the district between Herne Bay and Canterbury. In 1864, an old botanical friend of mine having informed me that, twenty years previously, when he resided at Wye, *Aporia crataegi* was the commonest butterfly in the neighbourhood of that place, I went with my father, on his recommendation, to stay there in the middle of June of that year. For upwards of three weeks we diligently explored the country about Wye, Ashford, Westwell, Chilham, Canterbury, Sturry, and Herne Bay; but during the whole of this period we never caught, or even saw, a specimen of this species, which I was assured by Mr. Robert Dombrain, then "reading" with a clergyman at Wye, had disappeared from the district since 1859. In lieu of *Aporia crataegi*, I had to content myself with a series of *Scoria dealbata*, then considered a much greater rarity than at the present day.

SUSSEX.—Mr. Jenner Weir has often told me that *A. crataegi* used to occur in great numbers near Keymer, and elsewhere, in Sussex, many years ago, but that he had only seen one specimen of it in the county since 1840.*

HAMPSHIRE.—My earliest capture of *A. crataegi* was made when I was a boy, on my first visit to Lyndhurst, as long ago as June, 1862.

* See Proc. Ent. Soc. Lond., 1884, p. 5.

On the 21st June, 1866, I caught eight specimens of this species on the open heath lying between Park Grounds enclosure and Park Hill enclosure, in the New Forest; and, on the following day, having explored the then, to *me*, unknown Forest some three miles to the west of this place, near Boldrewood, I suddenly came upon a colony or metropolis of this species, and in the course of two or three hours secured several dozen specimens. In June and July, 1868, the species was still more plentiful in the New Forest, especially between Boldrewood and Burley, about Puck Pits, Holm Hill enclosure, Vinney Ridge, Rhinefield Old enclosure, and in Warickslad—a long open space, full of old thorns and sloe-bushes, and well known as a locality for *Gladiolus illyricus*,—lying between the enclosure last named, and the Great Huntley Woods, and extending nearly as far east as Queen's Mead. By midsummer, 1870, the species had increased and multiplied in these localities to such an extent as to render the discovery of the pupæ on sloe-bushes, and the capture of five or six dozen imagos in the course of a few hours a matter of ease. Besides this, the distribution of the species had extended from Vinney Ridge and Warickslad to Alum Green and Butt's Lawn on the north, and as far east, and south-east as Denny Wood and Wood Fidley.

After the wet summer of 1871, *Aporia crataegi* gradually became scarcer in the New Forest. In 1872, it was again chiefly restricted to its head-quarters in the neighbourhood of Burley, Boldrewood, and Vinney Ridge, and its numbers were apparently reduced from hundreds to a few dozens. By 1875, the species had become still rarer; and in 1878 I caught my last specimen in the New Forest. Since that year I have never seen it in the district, nor have I heard of the capture by any of the local collectors of a single specimen since 1880.

HUNTINGDONSHIRE.—When staying with my father at Oundle, Northamptonshire, in June, 1865, for the purpose of collecting in Barnwell Wold, we visited Gidding Magna, and other places in the neighbourhood where the Rev. W. Bree used formerly to collect the species; but we never succeeded in finding it in this county.

NORTHAMPTONSHIRE.—In Stainton's "Manual," Peterboro' is given as a locality for this species; but I have never found it in this neighbourhood, nor at Oundle, Barnwell, or any other part of the county with which I am acquainted; nor have my correspondents, in this and adjoining counties, reported its capture for many years past.

HEREFORDSHIRE.—The late Edward Newman has recorded *A.*
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cratægi as formerly common near Leominster; but I never saw it in this county when staying at Hereford and Holm Lacy in 1867 and 1877.

MONMOUTHSHIRE.—Between the 24th and 29th June, 1867, I found this species, not uncommonly, in grass fields about one mile and a half to the north-west of Tintern, in the direction of Trelleck; and on the 4th of July of that year I discovered another locality one mile due west of Tintern, where the species occurred in the greatest profusion. Hundreds of specimens were flying about, or settling on the flowers of the Ox-eye daisy (*Chrysanthemum leucanthemum*), and on thistles, and I was frequently able to capture five or six specimens at one stroke of the net. The same locality also produced numbers of *Callimorpha dominula*.

Having secured a long series of *A. cratægi* in the New Forest in the previous year, I did not care to take a large number of the Monmouthshire specimens, but directed my energies to collecting *Vanessa c-album* and other species which occurred sparingly and required working for, and also to "sugaring" at night, which proved unusually attractive, especially to *Thyatira derasa*. Ten years after, on the 30th June, 1877, I again arrived at Tintern, and lost no time in revisiting the old *cratægi* localities, the natural conditions of which were unchanged; but instead of the swarms of this butterfly, which occurred there in 1867, only two specimens were seen during the whole of a fine summer's day!

GLAMORGANSHIRE.—During the years 1868 and 1869, I received liberal supplies of the larvæ of this species from two or three correspondents in this or adjoining counties. My correspondents have since reported the butterfly as apparently extinct throughout an entire district where it formerly abounded.

If, as appears to be the case, *Aporia cratægi* is really on the verge of extinction in England, to what causes is the result due?

The almost simultaneous disappearance of the butterfly from all its former localities, from Kent and Hampshire in the south-east and south, to Monmouthshire and Glamorganshire in the west, and Northamptonshire and Huntingdonshire in the midlands, cannot be attributed to the rapacity of collectors. It is possible that cultivation and drainage may account for the disappearance of this species from some of its former localities; though from the nature of its food-plants this seems improbable, as an abundance of hedgerow shrubs, like the whitethorn and blackthorn, and orchard trees, such as plum and apple, is not inconsistent with the highest state of cultivation.

Admitting, however, that drainage and "high farming" may possibly be the cause of the extinction of the species in some places, its disappearance from the New Forest cannot be thus explained: for the natural conditions of that district, with its vast moors, oak woods, dense beech groves, old thorns, and thickets of sloe-bushes, have undergone little change during the last five hundred years.

It seems more probable that the extreme scarcity, or total disappearance of the Black-veined White may be due to a succession of wet ungenial summers and mild winters. There are probably also other climatic changes in progress which, though imperceptible to us, may be the cause of the scarcity, or total extinction of this and other species formerly common in the United Kingdom.

Although the extinction of *Aporia crataegi* in England in the near future does not seem improbable, I trust that captures of the species during the coming season, may be recorded from many parts of England, and that the foregoing observations will be proved to be those of a pessimist.

Berrylands, Surbiton Hill :
February 5th, 1887.

The decadence of Aporia crataegi in Kent, and its probable cause.—The Editors of the Ent. Mo. Mag., in their last number in a note to a query by Mr. C. W. Dale, say, "We have no reason to doubt that this butterfly (*A. crataegi*) still occurs in the usual numbers in the district between Herne Bay and Canterbury." At the last meeting of the South London Entomological Society, the decadence of *A. crataegi* in Kent was somewhat fully discussed, and no member of the Society (present at the meeting) had taken the insect for many years in the localities that some years since produced it in such abundance. As a native of one of the localities (Strood, near Rochester), where it was most abundant (1850—1866), I can safely say that it has been exceedingly rare there, if not extinct, for some sixteen years. When I first commenced collecting butterflies in 1871, I was delighted by a local Entomologist (who had not collected since 1866 or '67, and since deceased) giving me several of our British butterflies, among them a number of *A. crataegi*, which he said was one of the most common butterflies in the district. The species, he said, abounded in the larval state on the whitethorn hedges surrounding a number of grazing fields near Strood (almost in the town), their webs being very conspicuous. Of course I searched for it, but in vain, and the only specimen I captured was in 1872 at Caxton in a clover field. Until the end of 1875 I was most energetic and scoured the district for miles around without success. I captured 47 species of our British butterflies in the years 1872—75 in that district, but never met with more than this one specimen, and have never seen it since. I have been repeatedly over many of its old haunts at the right time. Pupæ of the species have been offered occasionally for sale, but only, I believe, by dealers in foreign insects. May I suggest that migration lies at the bottom of the probable cause of the great falling off observed in the numbers of this species? I

do not think enough attention has been paid to the migration of insects as the chief source of supply of most of our species that occur in an erratic manner. I believe there is a great deal in the erratic appearance of our insects, that migration has to account for. Certain species (I suppose every one will grant) do migrate in immense numbers, and these are generally those which are locally abundant. What is more probable than that species, which have their natural home in the South of Europe, having arrived here, should fail to establish themselves in our changeable climate? That they are found a few years in succession does not prove that our climate is suited to them, but that their vitality is at its greatest and unimpaired when they arrive, and that the following seasons may be suitable for their development. *A. crataegi* will probably become common again, but not, I believe, until we get a fresh stock from the continent. I believe broader views on this subject are now taken by those British Entomologists who study *Lepidoptera* as a scientific recreation, but, of course, such opinions will never be adopted by *collectors* to whom a continental specimen is intolerable, even as a type for reference.—J. W. TUTT, Rayleigh Villa, Westcombe Park, S.E.; *February, 1887.*

NOTES ON THE SECOND EDITION OF CURTIS' BRITISH ENTOMOLOGY.

BY H. T. STAINTON, F.R.S.

That a second edition by John Curtis of any portion of the British Entomology existed was to me quite a piece of news.

Hagen, in his *Bibliotheca Entomologica*, does not seem to have had *personal* knowledge of the fact, though he says: "Nach Percheron ist von den ersten Nummern eine zweite Auflage erschienen."

In vol. xvi of the British Entomology, on the page which immediately follows the list of subscribers, a note occurs as under:

"The following is a list of the contents of the letter-press of folios 1 to 18, which have been reprinted and enlarged:

Folio 1—4 pages, 6 species described.	Folio 10—2 pages, 3 species described
“ 2—2 ” 2 ”	“ 11—2 ” 2 ”
“ 3—4 ” 7 ”	“ 12—10 ” 19 ”
“ 4—2 ” 3 ”	“ 13—2 ” 1 ”
“ 5—2 ” 7 ”	“ 14—2 ” 1 ”
“ 6—2 ” 3 ”	“ 15—4 ” 13 ”
“ 7—4 ” 2 ”	“ 16—8 ” 56 ”
“ 8—6 ” 21 ”	“ 17—2 ” 8 ”
“ 9—4 ” 7 ”	“ 18—4 ” 30 ”

Thus, to these 18 species there are 66 pages of letter-press, whereas in the original edition there are only 36 pages, showing an addition of 30 pages, besides there being frequently additional matter, even where the original allowance of two pages is not exceeded.

The 18 species which attained this distinction of a reprint may be arranged systematically as under:

COLEOPTERA.

<i>Cicindela sylvicola</i>	folio 1	2 additional pages
<i>Nebria livida</i>	„ 6	;
<i>Omaseus aterrimus</i>	„ 15	2 additional pages
<i>Molorchus minor</i>	„ 11	

HYMENOPTERA.

<i>Crasus septentrionalis</i>	folio 17	
<i>Peltastes pini</i>	„ 4	
<i>Chrysis fulgida</i>	„ 8	4 additional pages
<i>Eumenes atricornis</i>	„ 13	

LEPIDOPTERA.

<i>Lycæna dispar</i>	folio 12	8 additional pages
<i>Deilephila euphorbiae</i>	„ 3	2 additional pages
<i>Odontestis pini</i>	„ 7	2 additional pages
<i>Peronea rufocostana</i>	„ 16	6 additional pages

HEMIPTERA.

<i>Velia rivulorum</i>	folio 2	
<i>Notonecta maculata</i>	„ 10	

DIPTERA.

<i>Ctenophora ornata</i>	folio 5	
<i>Anthrax ornata</i>	„ 9	2 additional pages
<i>Empis borealis</i>	„ 18	2 additional pages
<i>Hæmobora pallipes</i>	„ 14	

It will thus be seen that 18 of the 30 additional pages are devoted to the *Lepidoptera*; the three Orders, *Coleoptera*, *Hymenoptera*, and *Diptera* having each only four additional pages allotted to them.

In folio 12, *Lycæna dispar*: in the original edition the letter-press was restricted to the generic characters, a description of the one species *dispar*, and a notice of its occurrence. In the second edition the 10 pages of letter-press include descriptions of 5 "coppers" and 10 "blues," and some additional notes on the larva and pupa of *Lycæna dispar*, of which Curtis had received living examples subsequent to the publication of the original letter-press of folio 12, and which he added to the plate. The original plate having no representation either of the larva or pupa.

In folio 3, *Deilephila euphorbiae*: the original edition contains only the generic characters, a description of *euphorbiae*, and a note of its occurrence. In the second edition, the 4 pages of letter-press contain descriptions of 7 species of *Deilephila* (this including three which we now refer to the genus *Chærocampa*).

I find from a sentence in folio 6, which treats of *Nebria livida*, that Mr. Curtis visited Braunton Burrows, North Devon, in September, 1822, in search of the larvæ of *Deilephila euphorbiae*; it seems

rather singular that this fact is not mentioned in the letter-press treating of the last-named insect.

Mr. Curtis' search at Braunton Burrows for the larvæ of *D. euphorbiæ* in 1822 was unsuccessful, and so was my own pilgrimage to the same spot some 35 years afterwards.

In folio 7, *Odonestis pini* is referred in the second edition to the genus *Dendrolimus*, and a much more detailed generic character is given; the two additional pages are devoted to *Odonestis potatoria*.

In folio 16, *Peronea ruficostana*: the original edition gives only the generic characters, and a description of *ruficostana*, with a list of some 42 species. In the second edition, in which the letter-press runs to 8 pages, 56 species (or what were *then* reputed as species) are described. I said *then* reputed, but the question is, *when*?

This second edition bears no date; but references are made in the reprint of folio 16 to Stephens' "Illustrations," and a description is copied from that work, which, by a reference to the page of the Illustrations, we learn was published "August 30th, 1834."

The date must, therefore, have been subsequent to that, and before the completion of the last (the 16th) volume of the British Entomology, the dedication page of which bears the date December 1st, 1839.

The Linnean Society possesses a copy of the original edition, the Royal Society a copy of the second edition of the British Entomology of John Curtis.

Mountfield, Lewisham, S.E.:

January 31st, 1887.

The Curtis collection.—In September last I made an inspection of the collection of English insects formed by Curtis, now in the posession of the University Museum, Melbourne. It will probably interest many to know that this collection remains in admirable condition; the drawers clean, and the specimens sound and fresh-looking throughout. Mr. Kershaw, the entomological curator, informed me that his principal trouble had been with verdigris; but that the collection was, so far as he knew, as complete as when received. I failed to find the type of *Eupaecilia anthemidana*, which Lord Walsingham had asked me to examine; there was no such name in the cabinet at all, and I think there can be no doubt that the insect never formed part of this collection. It is gratifying to find that these specimens have been as carefully and skilfully preserved as they could have been in England; but I would remark that the collection is really of no particular scientific utility in Australia—indeed, I doubt if any one there, besides the Museum authorities, knows of its existence—and I am surprised that some English Museum does not attempt to secure it by exchange, which might well be made very advantageous to both parties.—E. MEYRICK, Ramsbury: January 31st, 1887.

ON THE MOULTING OF THE LARVA OF *ORGYIA ANTIQUA*.

BY T. A. CHAPMAN, M.D.

I was led five years ago to make the following observations by Mr. Hellins having noted a variability in the number of moults this species underwent. I was also interested in the general question, as to how many was the normal number of moults in *Lepidoptera*, and whether the larva in each skin was to any degree distinct and definite, in the same sense that the larva is distinct from the pupa and that from the imago.

I may at once say that some of the larvæ which I reared moulted only three times, some four times, and some five times.

In its 1st skin the larva is very definite and easily distinguishable (apart from size) from those in the following skins, being black and very similar to an *Arctia* larva, in that it possesses a set of tubercles set with bristles, each tubercle and the hairs it carries being very similar to its fellows. It differs from *Arctia* in one very important point, viz., that each segment has only ten tubercles, instead of twelve as in *Arctia*, and in a more conspicuous though less important matter, namely, that the lateral tubercles of the second segment are very prominent and large. But it has no trace of the tufts of barbed hairs afterwards carried, nor any trace of the scarlet tubercles of the 10th and 11th segments, though traces of these and some coloration are distinguishable shortly before the first change of skin.

In the 2nd skin it is equally distinct and definite. It is now clearly of the *Liparis* family. The scarlet cups of the 10th and 11th segments are very distinct, the lateral tufts of the 2nd segment are represented by a few long special hairs, and the *dorsal* brushes of the 5th to 8th segments are represented by black pads (fused tubercles as it were) with a few special barbed hairs; all the hairs are still black.

In the 3rd skin the majority are easily distinguishable. The sub-dorsal tubercles are now pink, the barbed tufts are distinct on the 2nd, on the back of the 5th—8th segments, and on the 12th segment, the tufts of 5th and 6th are dark, from fuscous to black, those of 7th and 8th are pale.

In the 4th, 5th, and 6th skins the dorsal tufts are all pale in colour, and the lateral tufts of 5th and 6th segments appear. Though the latter are wanting in some, and in others there is a distinctly darker shade on the dorsal tufts of the 5th and 6th segments.

It thus happens that in a few of those in the 3rd skin there is a

slight approach to the panoply of the 4th skin, whilst again in the 4th skin some specimens approach the appearance of the 3rd; so that whilst the majority are abundantly distinct in these skins, in a few it is impossible to decide to which skin they belong.

From the 4th skin onward they are indistinguishable, although in the later skins the larvæ are more certainly furnished with the lateral tufts, and the dorsal tufts are more certainly of a uniform tint. But a larva in its 4th skin may be as mature in these respects as one in its 6th skin.

The first three skins, therefore, seem to be definite and fixed forms; the variability in moulting occurs in the later stages. When we come to enquire into the significance of this variability, we meet at once with one very decided fact, and that is, that those that moult only three times always produce male moths, those that moult five times always produce females, those that moult four times produce both.

We may go on one step beyond this. The apterous females of *O. antiqua* render in this instance more than usually marked the circumstance that is usual amongst insects, that the female is much larger than the male, from the fact that she contains a large number of eggs. There is another circumstance that is also usually associated with this fact, and that is, that the male emerges from the pupa a few days before the female.

Now, if we take the four-moulters, consisting of both males and females, this is not so, the females emerge first, but if we associate them in this order—

$\left\{ \begin{array}{l} \text{3-moulters males.} \\ \text{4-moulters females.} \end{array} \right.$	$\left\{ \begin{array}{l} \text{4-moulters males.} \\ \text{5-moulters females.} \end{array} \right.$
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we find that the usual rule of the males emerging first is observed.

This also shows more distinctly that another rule obtains in *O. antiqua*. It is one that obtains among bees, and would, I think, be found in other insects if observation on the point were made. It is this, that the male, though feeding as larva a shorter time (being a smaller insect), remains a longer time in the pupa state than the female, apparently requiring a longer time to undergo its full development.

It would thus appear that in *O. antiqua* the female moulted one time more than the male, a circumstance that I have not seen noticed as occurring in any species, and that further the moult may vary by one.

I do not think my observations justify any conclusions as to the circumstances governing this last point.

In a set of larvae reared carefully the 3 ♂ and 4 ♀ moulters were fully as numerous as the 4 ♂ and 5 ♀ moulters, but in a set reared carelessly, in so far that many were kept in one vessel, and their food being taken from different trees (always pear) at different times, was sometimes obviously unpalatable; there were hardly any 3 ♂ and 4 ♀ moulters, but there was a large mortality among these, and it is equally possible to conclude that the hard conditions of life killed the 3- and 4-moulters as that they changed them into 4- and 5-moulters.

These points then remain for further investigation. What determines whether or no a larva shall moult the additional time? Is it already pre-determined before it leaves the egg, or does it depend on conditions of weather, feeding, &c.? Would it be possible by selection to raise a race of *antiqua*, consisting entirely of 3- and 4-moulters, or again of 4- and 5-moulters, or of 4-moulters only? Do such species in any way occupy an intermediate position between others moulting on the one hand 4 times, and on the other 5 times as a fixed number?

Several species which hibernate in the larval stage are known or believed to vary in the number of moults, and hairy larvae which are said to vary in the number of moults, include many species that hibernate as larvae. It is, therefore, of interest to note that *O. antiqua*, though not hibernating, is closely related to several species that do so, such as *O. fascelina*, and the allied arctic species which is believed to pass more than one winter in the larva state.

If hibernation and variation in moulting are related, it would appear probable that the additional moults are a provision for prolonging the duration of the feeding period after an exceptionally bad time during the winter, and that the number of moults in any individual may vary according to its requirements determined in this manner, or on the other hand a less number of moults may represent what occurs in many species, viz., a rush to reach the perfect state as early as possible, and so escape hibernation and to become double-brooded.

This suggests the enquiry whether the summer broods of such species as *Selenia lunaria* and *illunaria*, which are smaller than the type, and have been described as distinct species, moult as often as the autumn brood.

Further investigation thus promises to throw valuable light on several questions concerning variability.

An isolated observation on *Acronycta alni* bearing on this matter may be worth mentioning. A few eggs were given me, from which I reared 5 larvae; 4 of my larvae moulted 4 times, but the 5th moulting

rather earlier than the others, so as to gain two days in 4 moults, in moulting the 4th time did not assume the adult livery, but was still in the "bird-dirt" stage, though larger than its fellows in that stage, and possessing the full complement of clubbed hairs, although they were pale and slender. It moulted an additional or 5th time, and then assumed the adult livery, and was larger than the others were, and had the clubbed hairs 1 mm. longer than theirs, and remained feeding 4 days longer.

Binghill, Hereford :

February 2nd, 1887.

ON THE PRIORITY OF VARIOUS GENERIC NAMES IN USE IN
BRITISH COLEOPTERA.

BY G. C. CHAMPION, F.E.S.

Now that a new Manual of British *Coleoptera* is in course of publication, it seems to me worth while to call attention to certain generic names which are employed not only in this, but also in other sections of zoology. The following list, compiled chiefly from the works of Agassiz, Marschall, and Scudder, shows the year of publication, &c., of the most important of these :—

Acalyptus, Schönh., Col., 1836; *id.*, Dum., Rept., 1853 (*Acalypta*, Westw., Hem., 1840).—*Acrognathus*, Er., Col., 1839; *id.*, Agass., Pisces, 1843.—*Alexia*, Leach, Moll., 1818; *id.*, Steph., Col., 1835 (= *Sphaerosoma*, Leach, 1819, = *Hygrotophila*, Chevr., in Dej. Cat., 1834). This name being pre-occupied in Mollusca, a new one is required in *Coleoptera*: *Sphaerosoma* is not available, it being already in use in *Crustacea* (Leyd., 1851) and in *Histeridae* (Mars., 1855); *Hygrotophila* could, however, be used.—*Anomala*, Steph., Col., 1830; *id.*, Schmidt, Moll., 1832.—*Anoplus*, Schönh., Col., 1826; *id.*, Gray, Rept., 1840; *id.*, Schl., Pisces, 1842.—*Atomaria*, Kirby, Col., 1830; *id.*, Bigot, Dipt., 1854.

Barynotus, Germ., Col., 1817; *id.*, Günther, Pisces, 1868.—*Bostrichus*, Geoffr., Col., 1764; *id.*, Fabr., *ib.*, 1775; (*Bostrychus*, Lacèp., Pisces, 1800). This name is generally written *Bostrychus* in *Coleoptera*, thus clashing with that of Lacèpède.—*Brachonyx*, Schönh., Col., 1826; *id.*, Swainson, Aves, 1837.—*Brachypterus*, Kug., Col., 1794; *id.*, Grav., Hymen., 1829; *id.*, Less., Aves, 1837; (*Brachyptera*, Newp., Neur., 1851; *id.*, Feld., Lep., 1874).—*Brontes*, Fabr., Col., 1801; *id.*, Montf., Moll., 1810; *id.*, Goldf., Crust., 1839; *id.*, Val., Pisces, 1840.

Calandra, Clairv., Col., 1798; *id.*, Less., Aves, 1837.—*Calodera*, Mann., Col., 1830; *id.*, Gould, Aves, 1836.—*Cantharis*, Linn., Col., 1735; *id.*, Geoffr., *ib.*, 1764; *id.*, Fer., Moll., 1821.—*Claviger*, Preysl., Col., 1790; *id.*, Hald., Moll., 1842.—*Colymbetes*, Clairv., Col., 1806; *id.*, Hübn., Moll., 1810.—*Conipora*, Blainv., Pol., 1834; *id.*, Sharp, Cat. Brit. Col., 2nd edit., p. 27 (1883), (= *Aspidiphorus*, Zieg., 1821); (*Coniporus*, Thoms., Col., 1859). *Aspidiphorus*, sometimes written

Aspidophorus, is also pre-occupied by Lacèpède (*Pisces*, 1802). If we adopt Thomson's name, which is quite as objectionable as that of Ziegler, and for the same reason, it should be written *Coniporus*.—*Conurus*, Kuhl, *Aves*, 1820; *id.*, Steph., Col., 1832; *id.*, Sharp, *Cat. Brit. Col.*, 2nd edit., p. 10 (1883); (= *Conosoma*, Kraatz, 1858), (*Conura*, Spin., *Hymen.*, 1837). *Conurus* cannot be used in *Coleoptera*, Kraatz's name should be adopted.—*Corynetes*, Herbst, *Col.*, 1792; *id.*, Heck., *Med.*, 1879.—*Crypticus*, Latr., *Col.*, 1817; *id.*, Swains., *Aves*, 1837.—*Cymindis*, Latr., *Col.*, 1806; *id.*, Cuv., *Aves*, 1817.

Dascillus, Latr., *Col.*, 1796; (*Dascyllus*, Cuv., *Pisces*, 1829).—*Dendrophilus*, Leach, *Col.*, 1817; *id.*, Fitz., *Rept.*, 1826; (*Dendrophila*, Swains., *Aves*, 1837; *id.*, Lioy, *Dipt.*, 1864).—*Diglossa*, Wagl., *Aves*, 1832; *id.*, Halid., *Col.*, 1837. This name being pre-occupied in *Aves*, it might, perhaps, be written *Diglotta* in *Coleoptera*; Kraatz having already used *glotta* instead of *glossa* in an allied genus (*cf.* *Berl. ent. Zeit.*, 1862, p. 300).—*Dolichosoma*, Steph., *Col.*, 1832; *id.*, Huxl., *Saur.*, 1867.—*Drusilla*, Leach, *Col.*, 1819; *id.*, Swains., *Lep.*, 1821.—*Dryophilus*, Chevr., *Col.*, 1832; *id.*, Fitz., *Rept.*, 1843.

Elenchus, Humphr., *Moll.*, 1797; *id.*, Curt., *Streps.*, 1831. A new name is required for this genus of *Stylopidae*.—*Eryx*, Daud., *Rept.*, 1832; *id.*, Steph., *Col.*, 1832; *id.*, Swains., *Moll.*, 1840; *id.*, *Ang.*, *Crust.*, 1851. It is doubtful whether the name has priority in *Reptilia* or in *Coleoptera*, both having appeared in the same year; if the former, *Prionychus*, Solier, could be adopted, *e. g.*, if *Eryx* be treated as generically distinct from *Cistela*.

Gibbium, Scop., *Col.*, 1777; *id.*, Gray, *Moll.*, 1840. — *Gyrinus*, Linn., *Col.*, 1733; *id.*, Shaw, *Rept.*, date?.

Heledona (*Elelona*), Latr., *Col.*, 1796; *id.*, Risso, *Moll.*, 1826.—*Helops*, Fabr., *Col.*, 1775; *id.*, Brandt, *Pisces*, 18—; *id.*, Dum., *ib.*, 1867.—*Hydaticus*, Leach, *Col.*, 1817; *id.*, Schönh., *ib.*, *Circ.*, 1826 (= *Phytobius*, Schönh., 1836).—*Hydrobius*, Leach, *Col.*, 1817; *id.*, Wright, *Moll.*, 1851.—*Hydrochus*, Germ., *Col.*, 1817; *id.*, Fall., *Dipt.*, 1823.

Ilyobates, Kr., *Col.*, 1856; *id.*, Sars, *Crust.*, 1865.—*Ischnoglossa*, K., *Col.*, 1856; *id.*, Sauss., *Mamm.*, 1860.

Lamia, Fabr., *Col.*, 1775; *id.*, Risso, *Pisces*, 1826.—*Lamprosoma*, Kirby, *Col.*, 1817; *id.*, Hall, *Rept.*, 1857.—*Lasia*, Wiedém., *Dipt.*, 1824; *id.*, Hope, *Col.*, 1840; *id.*, Muls., *ib.*, 1846; (*Lasius*, Fabr., *Hymen.*, 1804; *id.*, *Jur.*, *ib.*, 1807; *id.*, Latr., *Dipt.*, 1829; *id.*, Motsch., *Col.*, 1845). Crotch (*cf.* *Rev. Coccin.*, p. 90) has already noted that the name *Lasia* cannot be used in *Coleoptera*, and substituted that of Huber, *Subcoccinella* (1841), for it; the latter name is adopted in the second edition of Dr. Sharp's catalogue (1883).—*Leiosoma*, Steph., *Col.*, 1831; *id.*, Chevr., *ib.*, 1837; *id.*, Vict., *Myr.*, 1839; *id.*, Nic., *Arachn.*, 1855; *id.*, Cott., *Ech.*, 1861; *id.*, Feld., *Lep.*, 1874; (*Leiosomus*, Swains., *Pisces*, 1839; *id.*, Schönh., *Col.*, 1842; *Liosoma*, Brandt, *Ech.*, 1835, *id.*, Fitz., *Rept.*, 1843; *id.*, Rond., *Dipt.*, 1856). This name has thus been used over and over again; Stephens, however, has priority.—*Lissodema*, Curt., *Col.*, 1833; *id.*, Blanch., *Dipt.*, 1845.

Mesites, Geoffr., *Aves*, 1838; *id.*, Schönh., *Col.*, 1838; *id.*, Jen., *Pisces*, 1842; *id.*, Nik., *Ech.*, 1877. The name *Rhopalomesites* (Woll., 1873) is adopted for this genus in the second edition of Dr. Sharp's catalogue (1883); it is doubtful whether

the original name takes priority in *Aves* or *Coleoptera*.—*Metacous*, Dej. Cat. Col., 1883; *id.*, Gerst., *ib.*, 1855; *id.*, Kröy., Crust., 1839. This genus was not described in *Coleoptera* till 1855, the earlier being a mere catalogue name; it is thus pre-occupied in *Orustacea*; if *Metacous* be retained as generically distinct from *Rhipidi-phorus*, a new name is required.—*Microglossa* (*Microglotta*), Kraatz, Col., 1862 (*nec Microglossa*, Fauvel, 1866, = *Nanoglossa*, Fauvel, 1867); *id.*, Sharp, Cat. Brit. Col., 2nd edit., p. 7 (1883); (*Microglossum*, Geoffr., *Aves*, 1809; *Microglossus*, Wagl., *ib.*, 18—). To avoid confusion, it seems to me preferable to adopt Kraatz's original name, as is done in the Munich Catalogue; *Microglossa*, Fauvel (= *Nanoglossa*, Fauvel), was founded upon two Chilian species.—*Mniophila*, Steph., Col., 1831; *id.*, Boisd., Lep., 1840.—*Mononychus*, Germ., Col., 1824; *id.*, Guér., Hem., 1843.—*Myzia*, Brown, Moll., 1827; *id.*, Gray, Moll., 1840; *id.*, Muls., Col., 1846. This name cannot possibly be retained in *Coleoptera*; if *Myzia* is to be treated as generically distinct from *Coccinella*, a new name is required; it has as yet no synonym in *Coleoptera*.

Nitidula, Fabr., Col., 1775; *id.*, Jerd., Blyth, *Aves*, 1861.—*Notiophilus*, Dum., Col., 1806; *id.*, Schönh., *ib.*, 1836.

Ocalea, Er., Col., 1837; *id.*, Desv., Dipt., 1863.—*Ochthebius*, Leach, Col., 1817; *id.*, Montr., Hem., 1864.—*Octotemnus*, Mell., Col., 1847; (*Octotemna*, Blanch., *ib.*, 1850).—*Ocypus*, Kirby, Col., 1819; *id.*, Montr., Hem., 1861.—*Odontaeus*, Meg., in Dej. Cat. Col., 1821; *id.*, Klug, *ib.*, 1843; (*Odontaeus*, Agass., Pisces, 1839). This genus was not described in *Coleoptera* till 1843, a new name, it seems to me, is required for it.—*Orchestes*, Ill., Col., 1807; *id.*, Tschudi, Rept., 1838.

Pachyta, Meg., in Dej. Cat. Col., 1821; *id.*, Serv., *ib.*, 1835; *id.*, Menke, Moll., 1830. This genus was not described in *Coleoptera* till 1835, the name being then already pre-occupied in *Mollusca*; *Argaleus*, Lec. (1850), or *Brachyta*, Fairm. (Gen. Col. Eur.), 1868, might, perhaps, be adopted.—*Pelobius*, Schönh., Col. 1808; *id.*, Fitz., Rept., 1843; *id.*, Greef, Prot., 1870.—*Pelophila*, Dej. Cat., 1826; *id.*, Dum., Rept., 1853; (*Pelophilus*, Tschudi, Rept., 1838).—*Phlaeobium*, Dej. Cat. Col., 1833; *id.*, Erichs., *ib.*, 1840; (*Phlaeobius*, Steph., *ib.*, Curc., 1831; *Phlaobia*, Montr., Hem., 1864).—*Phyllobius*, Schönh., Col., 1824; *id.*, Fitz., Rept., 1843.—*Platypus*, Herbst, Col., 1793; *id.*, Shaw, Mamm., 1799; *id.*, Brehm, *Aves*, 1831.—*Platyrrhinus*, Clairv., Col., 1798; *id.*, Sauss., Mamm., 1860.—*Platystethus*, Mann., Col., 1830; (*Platysthetus*, Er., *ib.*, 1840; *id.*, Günther, Pisces, 1860). The name should stand as written by Mannerheim.—*Platytaurus*, Schönh., Col., Curc., 1840; *id.*, Fairm., *ib.*, Carab., 1850.—*Polydrusus*, Germ., Col., 1817; (*Polydrosus*, Schönh., *ib.*, 1826). This name should stand as *Polydrusus* in *Coleoptera*.

Rhinosimus, Latr., Col., 1802; *id.*, Dum., Rept., 1853.—*Rhizobius* (*Rhizobius*), Steph., Col., 1832; *id.*, Burm., Hem., 1835; (*Rhisobia*, Dej. Cat. Col., 1833). This name if written as originally adopted by Stephens, *Rhizobius*, would be less likely to clash with that of Burmeister.

Scymnus, Kug., Col., 1794; *id.*, Cuv., Pisces, 1817.—*Soronia*, Er., Col., 1843; *id.*, Moore, Lep., 1877.—*Symbotes*, Gerl., Arachn., 1857; *id.*, Redt., Col., 1858 (= *Clemmus*, Hampe, 1850; = *Michochondrus*, Woll., 1854). This name having priority in *Arachnida*, *Clemmus* (Stett. ent. Zeit., 1850, p. 358), not *Clemmus*, as given in the Munich Catalogue, could be adopted.

Tachinus, Grav., Col., 1802 ; (*Tachina*, Meig., Dipt., 1803). Dipterists might perhaps find another name to replace that of *Tachina*.—*Tetratoma*, Fabr., Col., 1790; *id.*, Fitch, Hem., 1851.—*Tiresias*, Bory, Polyg., 18— ; *id.*, Steph., Col., 1835 (= *Ctesias*, Steph., 1832). I have not been able to find the date of the publication of Bory de St. Vincent's name; it almost certainly, however, has priority over that of Stephens; in any case, Stephens' original name, *Ctesias*, might perhaps be employed to advantage here. Stephens originally wrote *Ctesias*, but subsequently changed it to *Tiresias*, on account of there being a prior *Ctesias* (Hüb., Lep.); the latter, however, was unaccompanied by description, and is not quoted by Agassiz and other nomenclators.—*Trichius*, Fabr., Col., 1775 ; *id.*, Hamm., Verm., 1838.—*Trichopteryx*, Hüb., Lep., 1816 ; *id.*, Kirby, Col., 1826. *Trichopteryx*, Hübner, being a genus merely in name, without description, the name in *Coleoptera*, of course, takes priority.

Xylophilus, Latr., Col., 1825 ; *id.*, Eschsch., *ib.*, 1829.

From the foregoing list it will be seen that by far the greater majority of these names are entitled to priority in *Coleoptera*. The remainder, however, have no such claim, and for these I have noted the next available name (a few of which have already been adopted by Crotch or Dr. Sharp), or, if none exist, have, with one or two exceptions, suggested a new one.

I have not included many other names which differ only in the terminal *us*, *a*, or *um*; it seems to me that these names, when they *express precisely the same meaning*, are very objectionable if retained for more than one section of zoology, and worse still if in use in two sections of one Class, *e. g.*, *Insecta*; it would be far better to retain the prior name only, and to change the later one. Other names in *Coleoptera* that have been universally in use for half a century at least, though pre-occupied in the same subject, it would certainly be very inadvisable to alter as recently suggested by M. Des Gozis; such names are *Bruchus*, *Byrrhus*, *Melolontha*, *Mylabris*, *Cistela*, *Scolytus*, *Tritoma*, &c. ; for remarks on this subject see Dr. Sharp's article, *Trans. Ent. Soc. Lond.*, 1886, p. 181.

11, Caldervale Road, Clapham, S.W. :
December 8th, 1886.

MORE ABOUT THE LUMINOUS NEW ZEALAND LARVÆ.

BY C. R. OSTEN-SACKEN, HON. F.E.S.

Since my last notice on this subject (*ante*, p. 133—134), I have received, through the kindness of Mr. Hudson, a specimen of the larva, preserved in spirits. As I anticipated, it belongs to the *Mycetophilidae*, and its snake-like shape (30 mm. length, and less than two mm. breadth) renders it very probable that it belongs to a very large *Sciophila* or to some genus related to it. The structure of the head

and of the parts of the mouth is exactly like the figures given in my paper, "Characters of the larvæ of *Mycetophilidae*." When I compare the head to that of the larva of *Sciophila*, as figured by me (*l. c.*, fig 7), I find that the palpi are less developed and more like those in figs. 1 and 2. The sutures on the upper-side of the head, which I called "occipital lines," converge towards the posterior margin of the head (somewhat like in fig. 4, f). The posterior margin, of the upper-side, projects in the middle, and has an emargination in the middle of the projection (somewhat like fig. 2, t, only less pronounced). On the under-side of the head, the posterior margin shows an excision which is broader than that in fig. 7. The shell of the head is much softer than that of the *Mycetophilæ* or *Bolitophilæ* which I have seen, brownish-yellow, that is, in consistency and colour exactly like the larvæ of *Sciophila* reared by me.

Mr. Hudson writes that he also discovered a luminous pupa suspended in one of the webs. "It is chiefly remarkable for a long process extending from the dorsal surface of the thorax and branching into several long filaments." Unfortunately, he did not succeed in rearing it. The pupæ of *Sciophila* seen by me were likewise suspended in the webs (see my above-quoted paper, p. 14); the long filaments I did not observe. I do not remember seeing my larvæ in the dark; but from their peculiar colouring I should not wonder if they were likewise luminous.

I have already mentioned (*ante*, p. 133) that I have recently reprinted my paper on the larvæ of *Mycetophilidae*, the original edition having become very scarce. It would afford me great pleasure to send a copy or copies, free of expense, to any one applying to me for them.

Heidelberg, Germany:
February 3rd, 1887.

A NEW SPECIES OF *POLYPHYLLA* FROM JAPAN.

BY GEORGE LEWIS, F.L.S.

POLYPHYLLA LATICOLLIS.

♂. *P. fullonis proxime affinis, at paulo latior; thorace castaneo; clypeo utrinque acute angulato.* *L. 35 mill.*

Very closely allied to the European *Polyphylla fullo*, Linn., but may be readily known from it by three or four characters. The head is larger, and the clypeus is more transverse, sometimes with the anterior edge bisinuate, and the angles are produced somewhat acutely, and are not rounded-off as in *fullo*. The frontal ridge is very distinctly elevated, and shows clearly the line where the clypeus begins. The

thorax is wider, $1\frac{1}{2}$ mill. in specimens measured, and relatively less constricted anteriorly. The pectination of the antennæ is larger, and each leaflet longer. All these characters are conspicuous, but I fail to see others, except the general colour of the thorax, which is castaneous rather than piceous.

The three males I possess have been captured in the plains between Fujisan and Yokohama, but I have not taken it myself. I am much indebted to Mr. Ota, of Tokio, for a very fine example.

Wimbledon: *February 12th, 1887.*

Occurrence of Stigmonota pallifrontana, Z., in England.—While looking over my series of *S. internana*, I lately became aware that one of the ♀ specimens differed from the rest. The insect in question I found, on referring to my notes, had been sent me eight years ago by Mr. W. Thompson, of Stoney Stratford. Indeed, it was the first example of *internana* that I possessed, and as such was placed at the head of my series. Accordingly, I wrote to Mr. Thompson, and, in answer to my queries as to his captures of *internana*, was informed that he only took one or two a season, and then always by sweeping flowers of *Heracleum sphondylium*, but that he had once taken a few in quite another place, upon a heath. He kindly sent me three more to look at, 2 ♀ and 1 ♂, when I at once saw that the second supposed ♀ was another ♂ of the same species as my original type. I expect that the insects Mr. Thompson captures on the heath are the real *internana*, while those he sweeps from the *Heracleum* flowers belong to the species new to us, *pallifrontana*, Z., which may be thus described:—F. w., dull blackish-brown; on the inner margin a curved yellowish-white blotch, containing a single dark brown curved line along its centre; on the costa are two yellowish-white spots before, and six beyond, the middle—not eight, as is generally the case,—the two nearest the apex being single, not geminated; face and palpi yellowish-white. From the 5th and 6th costal spots, reckoning from the apex, a fine blueish line curves across the wing to the hind-margin, slightly beyond the anal angle; along the lower edge of the hind-margin is an indistinctly marked coppery line. H. w., dull blackish-brown, alike in both sexes. Thorax, patagia, and abdomen all blackish-brown.

From its nearest allies, *compositella*, F., and *internana*, Gn., it may be thus distinguished:—The ground colour of the wings is distinctly brownish, not so black as in the other two. The markings are dull yellowish-white, instead of lustrous silvery. The hind-wings of both sexes are alike brown, whereas in the ♀s of both the other species the hind-wings are dark grey, and in the ♂s whitish towards the base. The face and palpi are clear yellowish-white, whence the name.

Moreover, in both its allies the lustrous line is obtusely angulated in the middle of the wing, and reaches the anal angle itself as a broadish, pale silvery, perpendicular blotch. Heinemann, p. 185, says that “each division of the blotch on the inner margin sometimes bears traces of a further sub-dividing line, in which cases it becomes difficult to distinguish them from those ♀ specimens of *compositella* in which the dark lines of the pale blotch are less distinctly marked.” In the specimens of *pallifrontana* which have come under my notice, I have observed nothing of this (nor, indeed, are such examples of *compositella*, as he here alludes to, very common with us).

In the "Jahrbücher des Vereins für Naturkunde in Nassau," vol. xx, p. 404, the late Dr. Rössler says of this species:—"The larvæ are full-fed at the beginning of August, in green pods of *Astragalus glycyphyllos*." As this plant is by no means a common one, and not likely to be passed unnoticed by a collector, I wrote again to Mr. Thompson, and received the satisfactory reply that at the place where he has taken the imago, there does grow a plant "from two to three feet high, like a large vetch or everlasting pea, which he has never observed anywhere else."

It would be well, therefore, for Micro-Lepidopterists, working in localities where this plant grows, to be on the look out for *pallifrontana* towards the end of May, when the imago makes its appearance, and to examine the pods of the *Astragalus*, in August, for larvæ.—W. WARREN, Merton Cottage, Cambridge: Feb. 14th, 1887.

Occurrence of another British example of Euzophera oblitella, Z.—Some 13 or 14 years since, I captured in the Isle of Wight an obscure-looking knothorn, which, after it had done duty for some time as a *Homaeosoma*, I at last came to the conclusion must be *oblitella*, Z., and Mr. Stainton has lately, I am glad to say, identified it as being that species.

This example was taken on the side of the road leading from Yarmouth to Freshwater, a little distance above Norton corner; and, if my memory serves me right, was at rest on a flower of *Inula dysenterica*, a plant which grows in great profusion thereabouts. I am not aware that the larva is known, but it may be that it feeds in the flowers or stems of *Inula*, as some of its congeners in those of ragwort. The other capture of this insect is recorded in the Entomologist, vol. xii, p. 16, as having been made also on the south-west coast of the Isle of Wight, in 1876.—ID.

Gelechia semidecandrella (n. sp.).—Last autumn but one, whilst inspecting Mr. Stainton's collection of *Tineina*, I was struck by the difference between his specimens of *Gelechia maculifera* and my own. On arriving at home, I sent my types to him, and he replied that the two series unquestionably represented two distinct species of insects. I have, therefore, named my species, *Gelechia semidecandrella*, from its food plant *Cerastium semidecandrum*. "The imago is very nearly allied to *maculifera*, but is smaller and narrower winged, the pale hinder fascia is less distinctly angulated, sometimes appearing as two pale spots, which nearly meet in a straight line. The basal portion of the wing is more distinctly marked, with a basal spot on the coeta, a spot a little away from the base below the subcostal nervure, and beneath that, slightly posterior, a spot on the inner margin." Such is Mr. Stainton's description of the insect, conveyed to me in a letter, and I feel that I cannot improve on so excellent an analysis, and so publish it in his own words. The larva is yellow, with a black head, and feeds in shoots, flowers and seeds of the food plant in April and May, the imago emerging late in June and July.—I. H. THRELFALL, Ashton, Preston: January 29th, 1887.

[This new species (*semidecandrella*) is the insect which I bred in 1863 from larvæ found in May on *Cerastium semidecandrum* at Mombach, near Frankfort on the Main, by my friend Herr Anton Schmid. The specimen which I bred was figured in vol. x of the Natural History of the *Tineina* as *G. maculifera*, for I had not then dis-

tinguished it from that species; it was the only bred specimen I possessed, and therefore the finest, and I consequently deemed it the fittest to be figured. Nearly the whole of the letterpress of *G. maculiferella* in vol. x, pp. 154—160, of the Natural History of the *Tineina*, really refers to *semidecandrella*. In the "Geographical Distribution," at p. 160, all refers to *maculiferella*, except the notice of the larva from Mombach, and the "Synonymy," pp. 160—162, refers solely to *maculiferella*. The specimens taken near Vienna, which I received from Herr Mann, occurred, as he informed me, amongst *Crataegus*, showing the same partiality as the species I take at Lewisham, in August, flying along a *hawthorn* hedge.—H. T. S.]

Habits of Hepialus velleda.—The following notice from the pen of Mr. M. Hill, of Little Eaton, near Derby, appeared in the Entomologists' Weekly Intelligencer for July 2nd, 1859 (Vol. vi, p. 107):—"I found, on the 21st June, a female *Hepialus velleda* just emerged from the pupa. I put her into a box with a bit of gauze over to keep her in; and when they were flying at night, I put the box upon the ground amongst the fern, and the males came a great deal faster than I could take them; in fact, I had no less than five or six in my net at once. Their flight is of very short duration, being little over half an hour." The reproduction of this observation may be of interest to the readers of Mr. Robson's notice in our last number (p. 214).—H. T. STAINTON: *February 9th, 1887.*

Occurrence of Tinea misella in corn warehouses.—In the beginning of November, finding that *Tinea granella* was still flying about one of the granaries, I looked through the corn warehouses to see whether anything else was still to be found there. To my great surprise I found *Tinea misella* commonly, sitting on walls and beams in the darker corners, and in charming condition—the largest and darkest specimens I ever saw. As far as I know, but one brood of this species has hitherto been noticed in this country—in July and August—and a November brood was therefore totally unexpected. Moreover, it has not hitherto been noticed as a devourer of corn—though I once found it inhabiting a stable—but in the present case it must, I think, have fed on maize or oats, or possibly cotton-cake. Specimens were to be found until December 10th.—CHAS. G. BARRETT, King's Lynn, Norfolk: *January 24th, 1887.*

Capture of Ptilodontis palpina at sugar.—During my collecting, in the beginning of July, I saw, at the sugar, several moths looking very much like *Xylophasia lithoxylea*, but which were exceedingly shy, taking to flight whenever approached with the light. This seemed strange at the time, as *X. lithoxylea* usually cared for nothing when it had once tasted the mixture. On several occasions I missed taking these suspects through attempting it with a bottle, but on using the net I found *Pt. palpina* in my possession. I cannot say that they were actually eating the syrup, but they were certainly attracted to the spot. Curiously enough I saw all the specimens (about a dozen if all the suspects were *palpina*) at the same tree, a large fir not far from the house, but in a very secluded spot well surrounded by lilac trees, and partially overshadowed by limes. This was one of the places I always sugared in my garden, but it was generally very thinly attended, probably owing to its sheltered position.—SYDNEY T. KLEIN, Clarence Lodge, Willesden: *January 14th, 1887.*

Note on the oviposition and the duration of the egg-stage of Ephemerella ignita.—A friend of mine (Mr. Hawksley) has succeeded in hatching eggs of the "Sherry Spinner" (♀ im.) or "Blue-winged Olive" (♀ subim.), as we call *Ephemerella ignita*. We took the eggs from an imago in July, and the first larva was hatched last week in his fernery.

The ♀ imago of *Ephemerella* carries its eggs differently from all other European May-flies. They issue part at a time, and take the form of a ball, adhering to the under-side of the extremity of her abdomen, and kept steady by means of her setæ, which are turned down underneath the ball. She flies about with the eggs in this position, while the mucus surrounding them hardens, dipping momentarily from time to time in her flight, and alighting now and then upon the water, until the ball becomes detached. This procedure is repeated until all of the eggs are discharged.

I have lately stated in the angling columns of "The Field" that one occasionally finds a subimago carrying the eggs, not in a ball but scattered, between the roots of the wings, on its back; and I have a single example of one not quite freed from the nymph-skin, which has the eggs so disposed.—FREDERIC M. HALFORD, 35, Inverness Terrace, Hyde Park, W.: *January 30th, 1887.*

A hibernating Dragon-fly.—Although the weather is very cold, I hunt—not Dragon-flies, but a Dragon-fly—*Sympycna fusca*. I took several specimens at the end of December, and a friend took one well on in January. I have just seen it in February. It is thus proved that in winters not exceptionally severe, *S. fusca* remains concealed in the heather, and comes out during the slightest sunshine.—RENÉ MARTIN, Le Blanc (Indre), France: *February 10th, 1887.*

[*S. fusca* (one of the *Agrionina*, allied to *Lestes*) is probably the only Dragon-fly known to hibernate. There is no apparent reason why it should not be found in this country, just as is the case with many others; but I think it may be safely said that it does not occur here.—R. McLACHLAN.]

Periplaneta australasiae, F., at Belfast.—Early in 1886, Mr. Barrett sent me for determination several examples of this pretty (for a Cockroach) species that had been found, probably in a warehouse, at Belfast: it has already been noticed as occurring in several Continental ports. It is common in Central America, the West Indies, Brazil, &c. I am not aware that it is a common *Australian* insect, notwithstanding its specific name. Fabricius (Ent. Syst., ii, p. 7) simply says "Capta frequens in nave e mari pacifico et regionibus Australasiae revertente," which, for a Cockroach, means nothing.—R. McLACHLAN, Lewisham, London: *Dec. 8th, 1886.*

Capture of Bradycellus collaris.—Within the last three years, I have taken a few specimens of *Bradycellus collaris*, Payk., on the Pentland Hills. Its habits are the same as those of *B. similis*, with which it is found in company; but it cannot be said to occur commonly, as it is much scarcer, and more local in its distribution on the hills than *similis*, and requires hard work to find. The first year I found only two specimens; in 1885 I took ten at an elevation of about 1200 feet; and last year I found about two dozen at the much lower level of 700 or 800 feet.—R. F. LOGAN, Colinton, Midlothian: *February 8th, 1887.*

Sacium pusillum, Gyll., at Birmingham.—On Christmas day last, one of my sons found a small beetle walking on the outside of an orange in my house at Smallheath, Birmingham. Being in some uncertainty as to the species, I sent it to the Rev. A. Matthews, who pronounced it to be *Sacium pusillum*.—W. G. BLATCH, 214, Green Lane, Smallheath, Birmingham: February 10th, 1887.

*Bythinus glabratu*s, Rye, at Sandown, Isle of Wight.—On April 12th, 1884, I captured a *Bythinus*, under a stone, on the side of a cliff at Sandown, Isle of Wight: it was found in company with ants, and with it I took *Trichonyx Maerkelii*: I did not pay much attention to it at the time, but, having lately had occasion to work at the *Pselaphidae*, I found that it was a specimen of *Bythinus glabratu*s; the species is easily recognised by its rufo-testaceous colour, glabrous elytra, and the very long first joint of the antennae; it was originally taken by Mr. G. R. Waterhouse's sons in August, 1865, in a mossy hollow on the chalk, on Seaford Downs, in company with *Trichonyx Maerkelii*, and a small yellow *Myrmica*. The same locality at Sandown has yielded me such good species as *Atemeles paradoxus*, *Cathormiocerus socius*, *Otiorhynchus ligustici*, &c.—W. W. FOWLER, Lincoln: February 5th, 1887.

Review.

THE BUTTERFLIES OF NORTH AMERICA: by W. H. EDWARDS. THIRD SERIES, Part i. Boston and New York: Houghton, Mifflin & Co. London: Trübner & Co. 1887.

True to his promise at the conclusion of the second series of this magnificent work, the author has commenced a *third* series, based on the original lines, which may probably contain sixty plates: and a notable feature is that several plates will be devoted to figures of the eggs of Butterflies, as indicating generic affinity and divergence. The author states that he has never found any difficulty as to obtaining eggs of Butterflies. This first part of the third series concerns varieties (or forms) of *Colias Eurydice*, *Argynnis Nitocris* (a truly magnificent species), and *A. Lais*. The text is as exhaustive, and the plates are as beautiful, as heretofore. *Colias Eurydice*, like many others of the genus, is liable to dimorphism, which in this case appears to be seasonal. Females of the autumnal brood were described by Mr. Henry Edwards under the name *amorphæ*, which refers to the food-plant (*Amorpha californica*).

THE SOUTH LONDON ENTOMOLOGICAL AND NATURAL HISTORY SOCIETY: January 27th, 1887: R. SOUTH, Esq., F.E.S., Vice-President, in the Chair.

Messrs. Barclay and C. Roberts were elected members.

Mr. J. Jenner Weir exhibited *Nilasera Pirama*, Moore, and *N. Amantes*, Hewt. Also a piece of amber containing five insects. Mr. Billups, living specimens of *Rhagium bifasciatum*, Fab., from Braemar, and contributed notes. Mr. Weir communicated a paper, "Notes on the comparative rarity of *Lepidoptera*—*Rhopalocera*, once common in the neighbourhood of Lewes." He said that *Aporia crataegi* was very abundant at Keymer in the year 1838, the following year he saw but one, and although he visited the locality for 15 years afterwards, he never saw the species there

again; it seemed now to be extinct in the district. He was of opinion that in the earlier decades of the century, a flight of this insect visited Sussex from some part of the continent, and the climate not proving favourable, it had gradually become extinct. It had almost entirely disappeared from the New Forest, where it was at one time very abundant. *Leucophasia sinapis* was a case of an indigenous insect becoming extinct in certain parts of Sussex, and from the weakness of its flight, it was not likely to have immigrated. *Vanessa c-album*, which was now extinct in Sussex, was, at one time, so common in the hop gardens, that the peasants had a local name for it, viz., the "silver bug." After referring to several other species, Mr. Weir, in conclusion, said that as to the cause of the progressive rarity of the species mentioned, he could not hazard a conjecture, but he felt tolerably certain that it had not been brought about by the Entomologists.

At the close of the paper a discussion took place, Mr. Tugwell stated that some years ago he had taken *A. crataegi*, at Herne, near Herne Bay. Mr. Chaney said it was at one time very abundant near Rochester, and, in fact, all over the Hundred of Hoo, but it disappeared about the year 1871. *L. sinapis* used also to be abundant in a wood near Chatham, but after the year 1856 it gradually became scarcer, and about 1858 or 1859, disappeared.

February 10th, 1887: R. ADKIN, Esq., F.E.S., President, in the Chair.

Messrs. H. Collings and L. F. Hill were elected members.

Mr. S. Stevens exhibited a remarkable variety of *Vanessa Atalanta*, L., and a suffused variety of *V. Io*, L. Mr. R. Adkin, *Spilonota incarnatana*, Hb., bred from larvae found in shoots of *Rosa rubiginosa*, in the heart of Surrey, 40 miles from the coast. Mr. C. A. Briggs, a large number of *Lycana Corydon*, Fb., including dwarfed forms, blue and brown forms of the female, varieties with the spots absent from the under-side, in excess of the usual number, and running into streaks. Mr. R. South, species of British and Foreign *Lycanidae*, and contributed notes, calling particular attention to a variety of *L. Corydon* from Asia Minor, which, so far as he could remember, was similar to the varieties exhibited by Mr. Sabine at the Society's meeting on the 7th October last, who had stated that he had seen *L. bellargus* and *L. Corydon in copula*. This, Mr. South said, was quite possible, and he was of opinion that this variety was a hybrid between the two species referred to. Mr. Tutt thought the specimen referred to was simply a local form of *Corydon*. Mr. E. Joy exhibited *Lepidoptera* from the New Forest. Mr. Carrington contributed a paper, "Hibernation and aestivation."—H. W. BARKER, *Hon. Sec.*

ENTOMOLOGICAL SOCIETY OF LONDON: February 2nd, 1887.—Dr. D. SHARP, F.Z.S., President, in the Chair.

The President nominated Mr. Robert McLachlan, F.R.S., Mr. Osbert Salvin, M.A., F.R.S., and Mr. Henry T. Stainton, F.R.S., Vice-Presidents during the Session 1887—1888.

The Rev. J. W. Holland, M.A., of Pittsburgh, United States; Dr. F. A. Dixey, M.A., Fellow of Wadham College, Oxford; Mr. C. J. Gahan, M.A., of Brompton, S.W.; and Mr. Sydney Klein, F.R.A.S., of Willesden, N.W.; were elected Fellows.

Mr. P. Crowley exhibited a new species of *Synchloë* (*S. Johnstoni*) from Kilima-

njaro ; also, for comparison, specimens of *Synchloë mesentina* and *S. bellica*, which the new species closely resembled.

Mr. W. White exhibited a number of preserved larvae of European *Lepidoptera* in various stages of growth (including nine examples each of *Saturnia carpini* and *Deilephila euphorbiae*), illustrating the gradual development of the markings and colours, as explained by Prof. Weismann, in his "Studies in the Theory of Descent."

Mr. Gervase F. Mathew exhibited a variety of a female of *Lycæna Telicanus*, from the neighbourhood of Gallipoli, Turkey ; also some specimens of a *Lycæna* from Vigo, believed to be varieties of *Lycæna Baton*, but differing from the type in being much larger and darker. He further exhibited several examples of a *Leucophasia* from Vigo, which appeared to be identical with *L. astiva*, Staud.

Mr. Porritt exhibited, on behalf of Mr. N. F. Dobree, a series of a remarkable red form of *Tæniocampa gracilis*, bred last season from larvae collected in Hampshire.

Mr. Eland Shaw exhibited specimens of *Pachytalus cinerascens*, Fab., *Mecostethus grossus*, Linné, and *Gryllus flavipes*, Gmel., and read a "Note on the Identity of *Gryllus (Locusta) flavipes*, Gmel."

The Secretary read a communication from Prof. Riley, of Washington, on the subject of the "Australian Bug" (*Icerya Purchasi*). It was stated that the insect had of late years become very destructive to various trees and shrubs in California, into which country, as well as into New Zealand and Cape Colony, it had been introduced from Australia, where it was believed to be indigenous ; but on this point further evidence was asked for.

The Rev. T. A. Marshall communicated "A Monograph of the British Braconidae," Part 2, being a continuation from Part 1 of the "Transactions" for 1885.

Mr. Francis P. Pascoe read a paper entitled "Descriptions of some new species of *Brachycerus*."

Mr. Francis Galton, F.R.S., read a paper on "Pedigree Moth-breeding as a means of verifying certain important Constants in the General Theory of Heredity." In this paper Mr. Galton suggested the institution of a system of experimental breedings, to be continued for several years, with the object of procuring evidence as to the precise measure of the diminution of the rate at which a divergence from the average of the race proceeds in successive generations of continually selected animals. Mr. Frederic Merrifield read a paper (by way of appendix to Mr. Galton's paper) entitled "A proposed method of breeding *Selenia illustraria*, with the object of obtaining data for Mr. Galton." Mr. McLeachlan said he considered the fact that *S. illustraria* was dimorphic an objection to its selection for the experiments proposed by Mr. Galton, and he suggested that the Common Silkworm Moth, or some other large Bombyces, would be more suitable for Mr. Galton's purposes. Prof. Meldola called attention to some observations on *Selenia illustraria* by Dr. Knaggs in vol. iii of the Ent. Mo. Mag., which had some bearing on the projected experiments ; and he remarked that although, for some reasons, the species selected was well adapted for testing Mr. Galton's conclusions, he believed that the fact of the moth being seasonally dimorphic was likely to introduce disturbing elements into the experiments which might influence the results.

The discussion was continued by Messrs. Sharp, Baly, Kirby, White, Klein, Porritt, Dunning, Waterhouse, Bates, Merrifield, Galton, and others.—H. Gross,
Hon. Secretary.

NOTE ON SOME BRITISH COCCIDÆ (No. 6).

BY J. W. DOUGLAS, F.E.S.

ASPIDIOTUS OSTREEÆFORMIS.

Aspidiotus ostreeæformis, Curt., Gard. Chron., 1843, p. 805 and fig.*Nec Diaspis ostreeæformis*, Sign., Ess. Cochin., p. 121, pl. v, fig. 4; *nec D. ostreeæformis*, Comst., "Report," 1880, p. 811, pl. xv, fig. 4, and "Report," 1883, p. 94, No. 65. ? *Diaspis ostreeæformis*, Goethe, Jahrbuch d. nass. Ver. für Naturkunde, 1884, p. 114, pl. i, fig. 1—5.

♀ scale round, 1—1·5 mm. in diameter, slightly convex, greyish-black; exuviae nearly central, unicolorous, ashy-grey or usually dark yellow or rust colour; the surface rough or striate, often with a grey efflorescence (the largest were abnormally swollen and parasitized).

♂ scale much smaller, oval; exuviae more lateral.

♀ adult: the last abdominal segment with five groups of spinnerets, anterior 3—5, anterior-lateral each 6—9, posterior-lateral each 6—10; the margin with two median lobes, followed on each side by two deep emarginations, between which is a spinose hair, and but one further on towards the next segment, but these are not always present or apparent.

♂ imago ochreous, thorax with a deep semi-oval depression, with a black transverse streak at the base between the wings; wings large, broad, whitish; antennæ hairy, stout, almost as long as the body, apparently 8-jointed, but having also two very minute, intermediate, as adjuncts.

Curtis described his *Aspidiotus ostreeæformis* thus:—

"On the bark of a pear tree, covered with seurfy scales, exactly the colour of the bark, mostly orbicular, but a few oval; dark ashy-grey, a little convex, slightly wrinkled, margin membranous and whitish, and between it and the centre a raised semi-transparent spot of an ochreous or rusty colour; when the scale is removed a whitish or greyish spot is apparent upon the bark, on this the ♀ rests; inside of scale hollow like a shallow cup, at the top of which the yellowish horny spot very distinct; outer margin of scale broad, whitish, formed of the membrane which attaches it to the bark.

"The ♀ orbicular heart-shaped, fleshy, fat, shining, yellowish-white, with a few short hairs scattered over the sides; tail distinct, quite yellow, with a suture beneath; neither legs nor antennæ, but on the under-side, a minute nipple, from which issued the rostrum of considerable length.

"Male under an oval scale; bright ochreous; head small, eyes black, antennæ nearly as long as the animal, hairy, stout, 8-jointed; thorax large, ovate, collar distinct, a black transverse stripe between the wings; scutellum large, semi-ovate. Wings ample, whitish, rounded; halteres of two joints ending in a curved bristle."

Signoret places *Aspidiotus ostreeæformis*, Curtis, as a *Diaspis*, saying (p. 122):—

"The scales of the ♂ are a little longer than those of the ♀, brown, with the exuviae on one side; but afterwards (p. 441) he says this indication is erroneous, and that "he has always found the ♂ scale very small, white, carinated, with the exuviae at the extremity, as in all other scales of the group."

Of the ♀ he says:—"There are five groups of spinnerets; median 10—12,

superior lateral 12—13, inferior lateral 13—14. The margin has two median trilobed lobes; on each side some small emarginations, and beyond, as far as the preceding segments, 9—10 spines." In our species the number of spinnerets is much less, the median lobes are not trilobed, and the marginal spines are certainly not 9—10, only two or three.

Comstock described his *Diaspis ostreiformis* from materials received from Dr. Signoret, and therefore it is the same as Dr. Signoret's.

Goethe's *Diaspis ostreiformis* appears, on the whole, to be the *Aspidiotus ostreiformis* of Curtis, for he says:—"I observe that the scales of the ♂ are not essentially different from those of the ♀;" therefore, they are not those of a *Diaspis*. He makes out 9 joints in the antennæ of the ♂, but, as before stated, this may only be a matter of observation. The doubt about the identity of his species with that of Curtis arises from his statement of the number of spinnerets in the respective groups being—"middle 10—12, upper lateral 12—13, lower lateral 13—14,"—being the same as given by Signoret for his species, but not the same as found in ours. Mr. G. S. Saunders prepared a number of specimens that I had collected from plum, apple, pear and cherry trees; he found they all exhibited exactly the same characters, and the number of spinnerets, &c., to be as I have stated above.

About the middle of March last I noticed that the trunk of a plum tree had on the bark numerous white spots about a millimètre in diameter, and on examination I saw that they were the ventral skins of old scales of an *Aspidiotus* that had fallen off and left these affixed. Looking more closely I saw other scales of a previous generation still remaining, but they were loose and came off with a touch; and there were also numerous recent scales adjacent, either in batches or single, tightly adherent. Other scales of the same sort were abundant on apple, pear and cherry trees. From some that I removed, still attached to pieces of the bark, and put into gauze-covered glasses indoors, I obtained a few males early in May. My description, made at the time, agreed so closely with that of Curtis's *Aspidiotus ostreiformis*, that I quite believed I had found that species; but there was just room for a doubt, because, although I diligently searched, I could not detect the "very small, white, carinated scale" which Signoret attributes to the ♂ of this species, and which gives the character of *Diaspis*. However, I eventually came to the conclusion that Signoret's species was not the same as that of Curtis, as he had deemed; but in order to elucidate the matter, I sent some examples to Professor Comstock, of Cornell University, Ithaca, New York, the State Entomologist, than whom no one has had greater experience in the examination of *Diaspina*, and he having very kindly devoted a considerable attention to them, writes thus:—

"I think now that the species described by Curtis is an *Aspidiotus*, and I believe that the species we are studying is the one. The description agrees well with this species, remarkably well for one written at that time; even the hairs on the sides of the female figured by Curtis are represented by tubular spinnerets in the position indicated. Signoret evidently made a mistake in his determination; fortunately the two insects belong to different genera, so that there need be no change of specific names. I am very glad to have this matter cleared up, for I have never been satisfied with Signoret's determination.

"*Aspidiotus ostreiformis*, Curtis (as we now understand it), resembles my *A. juglans-regiae* very closely; I expect that my name will prove to be a synonym. The scales on apple, cherry and locust (see my report for 1880, p. 301) are smaller than those I found in California on English walnut, and are darker, and there are very slight differences in the margin of the last segment of the female; but I am inclined to believe that the form on walnut is a climatic or phytophagous variety of *A. ostreiformis*."

This opinion of one who is so good an authority is, I think, very satisfactory.

PARLATORIA PROTEUS.

Aspidiotus Proteus, Curt., Gardeners' Chronicle, 1843, p. 676 and fig.

Parlatoria orbicularis, Targ.-Tozz. Cat., 42 (1868).

Parlatoria Proteus, Sign., Ess. Cochin., 132, pl. 5, fig. 5 (1869); Comst., Report, 1883, p. 114, 96, pl. ii, fig. 7, 7a, pl. iv, fig. 3.

The genus *Parlatoria*, one of the most remarkable of the sub-family *Diaspina*, primarily indicated by Targioni-Tozzetti for two species, *Aspid. Proteus*, Curt., and *Coccus ziziphi*, Lucas, was first characterized by Signoret from the same species in part 5 of his "Essai sur les Cochinelles," published in the "Annales" of the Entomological Society of France, 1869, as follows:—

"♀. Scale long, narrow at the base, then abruptly enlarged, exuviae rounded-oval. Only four groups of spinnerets. The margin of the anal segment as if crenulated, and having some plate-like scales in each of the emarginations. On the surface, near the margin, two rows of isolated spinnerets. ♂ scales of the same colour as that of the ♀, and much smaller."

The most important generic character is the structure of the outer margin of the last segment of the abdomen of the female, namely, three large lobes, and normally, a fourth smaller, on each side of the median, each bearing a basal spine, separated by deep emarginations, in each of which are flat plates, oblong, parallel-sided, as long as the lobes, their extremity having an acicular fringe, viz., two between the median lobes, two between the 1st and 2nd, and three between the 2nd and 3rd; the bases of the lobes connected by crescent-shaped thickenings of the integument. Between the 3rd and 4th lobes three plates varying in form. On the lateral margins of the three preceding segments, as well as some on the margin of the last beyond the lobes, are fringed plates, usually palmate, but varying in form and number from five to ten.

In *P. Proteus* the ♀ scale, normally elongate, but often short, flat, broad-oval, pale yellowish-brown, the first exuviae rounded-oval, the 2nd long-oval and conspicuously large, the 3rd smaller.

Length, 1.5—2 mm.

♂ scale narrow, linear, coloured like the ♀, but the exuviae at the base black; the middle not keeled, but depressed, or with a longitudinal fissure when the imago has come out.

Length, 1 mm.

♀ adult: only three marginal lobes on the last segment, the 4th being replaced by a fringed plate.

♂ imago clear reddish-yellow, wings white with red nerves (Signoret).

In May last Mr. P. Cameron sent me some leaves of *Dendrobium* and *Oncidium* having on the under-side, along the midrib, numerous scales, which proved to be those of the ♀ of *Parlatoria Proteus*; on the same leaves were also a few of the ♂ scales, situated either singly or in small batches, but empty.

Var. *crotonis*.—At the same time Mr. Cameron sent me some leaves of a *Croton*, to which were attached, on the under-side, along the midrib and under the incurved edges, many scales exactly like the ♀ of *P. Proteus*. But examination of the insect beneath, made by Mr. G. S. Saunders, showed a divergent structure of the margin of the last segment which approximated that of *P. Pergandii*, and this being a species described by Prof. Comstock, and of which there was a *quasi* variety—*camelliae*—(Report, 1883, p. 114), I thought it best to send him some of these scales. He says respecting them:—

"The *Parlatoria* on *Croton* approaches *P. Pergandii* in having the 4th and 5th lobes, but these are very small. Laterad of the 5th lobe there are fewer plates than in either of the species described. The scale resembles that of *P. Proteus*."

In December I received from Mr. Sowerby, Royal Botanic Society's Gardens, Regent's Park, leaves of three species of *Croton* on which these scales were abundant.

On plate iv of his "Report" for 1883, Professor Comstock has figured the margin of the last segment of the ♀ of the three known species of *Parlatoria* (including the var. *camelliae*) showing the difference of structure at one view.

THE GENUS LEPIDOSAPHES, SHIMER.

Only quite recently there has come under my notice a Note by Dr. Franz Löw, in the "Verhandl. der k. k. zool.-botan. Gesells. Wien," 1882, p. 522, to the effect that the genus *Lepidosaphes*, Shimer, founded on *Aepidiotus pomorum*, Bouché, published in vol. i of the "Transactions of the American Entomological Society," 1868, has priority over Signoret's genus *Mytilaspis*, characterized in part 6 of his

"*Essai sur les Cochinelles*," which was presented to the Société entomologique de France, 25th March, 1868, and published in the Society's "Annales," Tome X, p. 91. Signoret (*t. c.*) notices Shimer's work thus: "Tout dernièrement M. Shimer a créé pour ces espèces un nouveau genre qu'il appelle *Lepidosaphes*: nous aurions adopté volontiers ce nom, si déjà M. Targioni et nous-même n'avions publié l'*Aspid. conchiformis* sous le nom générique de *Mytilaspis*, nom qui lui est très-bien approprié par sa ressemblance avec une moule." Targioni, in his Memoir, p. 44, also refers to *Lepidosaphes*, Shimer, but only as a synonym of *Mytilaspis*.

Not being able at that time to put my hand upon Shimer's paper, and being then in the act of writing to Professor Comstock, I asked his opinion. Before I had his answer I had read Dr. Shimer's article, and a very interesting account it is of the structure and natural history of *Aspidiotus pomorum*, Bouché (erroneously cited as *Coccus conchiformis*, Gmel.), from the newly-hatched larva to the egg-laying female; and it is noteworthy that with the most careful continuous observation he did not see a male in any condition, this being confirmatory of all other observers. Shimer does not appear to have investigated the structure or metamorphoses of any other species of *Diaspina*, or he would have seen that most of the characters he puts as generic belong also to most of the Sub-family. But the consideration of any question of dubious priority of publication is rendered superfluous by the facts that in the definition of *Lepidosaphes* some important generic specialities of the insect, and of other species naturally associated with it (*e. g.*, the peculiar form of the scale, &c.), are omitted, and one, "male unknown"—a specific character only—is inserted; therefore, the genus is not equivalent to the more fully characterized *Mytilaspis*, and cannot be adopted in its place. The Family *Lepidosaphidae*, sought to be established on the same narrow grounds as the genus, merges into *Diaspis* (now *Diaspina*), a division made by Costa in 1827.

Subsequently, I received Professor Comstock's reply, as follows, his conclusions and mine being practically the same:—"It is quite probable that the name *Lepidosaphes* was published before *Mytilaspis*, but I think that the former name has no claim to recognition. Shimer made the (to him) wonderful discovery that the scale of the apple tree bark-louse was distinct from the body, and that the tarsi of the larvæ bore digituli. These characters, together with the supposed absence of tarsal claws, he thought of sufficient importance to establish a new genus, and to make it the type of a new family. This is the gist of two pages of small print. If *Lepidosaphes* stands for anything, it includes the whole of the scale-bearing *Coccidae*, *i. e.*, the *Diaspina*. The name *Diaspis* was proposed for this group by Costa in 1827. *Lepidosaphes* is therefore a synonym of the much older name *Diaspis*, and had no claim to recognition in the subsequent division of the genus."

ADDENDUM.

Pulvinaria camellicola (*cf.* vol. xxii, p. 159). I have this from Kew Gardens on the Orchids *Oncidium papilio* and *Calanthe natalensis*.

8, Beaufort Gardens, Lewisham :

February, 1887.

SOME NOTES ON THE COMPARATIVE STUDY OF BRITISH AND
CONTINENTAL *RHOPALOCERA*.

BY W. F. DE V. KANE, M.A., F.E.S.

The scientific British entomologist is at a considerable disadvantage in studying the problems of variation presented by our insular entomological fauna, for want of good public collections of Continental insects. I purpose to indicate in this paper some lines of enquiry, to which a comparison of our British *Rhopalocera* with those of the Continent invites consideration.

Mr. Wallace, in his "Island Life," has directed attention to morphological phenomena developed under insular conditions amongst birds. Mr. Wollaston, in his "Insecta Maderensis," and other works, pursued similar enquiries amongst *Coleoptera*. Both of these eminent naturalists shew that frequently the most surprising and interesting results arise through the segregation of a comparatively limited number of individuals from the large mass of their fellows on Continental areas. This isolation begets variation, for, as Darwin states, "Inter-crossing plays a very important part in Nature in keeping the individuals of the same species, or of the same variety, true and uniform in character." Since isolation, therefore, plays such an important part in the formation or encouragement of new varieties and species, the comparison of British varieties among each other, a subject which has attracted much attention of late, is quite subsidiary in importance to their relation to their Continental analogues. It is, therefore, full time to raise a voice of warning and protest against some dangers that now threaten. The competition amongst British entomologists has latterly become so keen, that an insect with a new pattern (for, unfortunately, it is to be feared that varieties are frequently valued for little else) fetches an extraordinary price at auction rooms. Their money value having been much enhanced, it is not surprising that they should be manufactured to meet the demand. And another element of doubt and difficulty has also been added by the sale of Continental specimens to amateurs desirous of completing their English collections. Take, for instance, *Syricthus malva* (*alveolus*, H.), our sole representative of that genus among the *Hesperiidae* (and for that reason a most interesting insect, considering what a variable and numerous group of Continental cousins it has). Who can tell whether the specimens of *ab. Taras* that are to be found in most English cabinets are all truly British?

Before any conclusions are attempted to be drawn from the

variations presented by this species in England, it is primarily necessary to have a numerous series, the authenticity of which is past question.

And who can say how far the British specimens of several formerly rare species of *Lepidoptera* latterly offered in considerable numbers for exchange or sale, are the descendants of an ancient British stock, or merely the great grandchildren of a modern experiment at acclimatization? Unless a resolute and combined effort is made to check these and other modes of tampering with our indigenous fauna, it is possible that in a short time, lessons which ages of isolation have accumulated for our instruction, will be obliterated for ever.

But there are other natural causes which bring about modifications in pattern and size besides the isolation which the ancient geological disruption of Great Britain from the rest of Europe has effected. Of these we may instance the effect of climate as one of the most important, and since ours is confessedly peculiar, we have a second test to apply when instigating a comparison between our own and Continental examples. One form of climatal influence also is that which depends on altitude. And this has been found to affect both botanical and zoological organisms in a similar manner as latitude. Higher latitude in fact corresponds to increased altitude. I will not, however, pursue the subject further in its general bearings, but will take up a few points worth noting in a cursory survey of our *Diurni*.

The first butterfly in the British list is *Papilio Machaon*. This, though said formerly to have existed in many places in England, is now closely restricted to one or two localities, and, therefore, if it survives, is the more likely to vary from the Continental type. The genus to which it belongs presents aberrant tendencies in the proportionate breadth of the black bands, in the length of the "tail" on the hind-wings, and in the warmth or pallor of the yellow ground-colour. The size of the eye spots at the anal angle of the hind-wing also varies. I do not know whether British specimens exist illustrative of similar tendencies. The Corsican species, *P. Hospiton*, appears to have become specialized through isolation, and to be a result of the first two tendencies in *Machaon*. In the *Pieridae*, *P. napi*, deserves careful and systematic attention at the hands of British entomologists. Not only does it display a dimorphic form, differing in the two seasons of emergence, but occasionally in Ireland, and doubtless elsewhere the ♀ presents a dingy appearance, with strongly shaded ray-markings on the under-side, that reminds one much of the Alpine and Scandinavian variety *bryoniae*. This form, and the pale spring form of *Vanessa levana* are considered by some to be surviving witnesses of the effects of the Glacial Epoch. As the Scotch and Irish fauna seem to be strongly Scandinavian in their features, it is probable that in these countries interesting varieties of the above *Pieris* may turn up.

Of the genus *Euchlöe, cardamines* is our only representative. Among other species the white of the under-side of the hind-wings turns silvery in hot southern

districts. A similar phenomenon is also displayed in the genus *Caenonympha*. *Euchlöe Eupheno* frequently presents very diminutive specimens flying in the same locality with those of the normal size; and hermaphrodites occur not very rarely. It is also noticeable that the orange of *cardamines* sometimes extends so far as to embrace the discoidal spot.

Leucophasia sinapis varies in the shape of the apical blotch of the ♂ in spring and summer, while in the ♀ it is partially or entirely absent. Another aberration presents an entirely white under-side of the hind-wings.

Of our two species of *Colias*, *Edusa* shows a bleached ♀ form, which, like the pale *Vanessa levana* of springtime, and the Alpine variety of *Pieris napi*, is said to bear testimony to a former sub-arctic climate. Several other European species of *Colias* present a similar bleached ♀ dimorphism, as well as some species from Africa and America. In *C. Hyale*, ♀, the bleached form is the usual one, while it is said that a more strongly coloured aberration has been also observed, but very rarely. *C. Palæo* likewise has a pale ♀ usually, and only occasionally a form approaching the ♂ coloration. The ordinary ♀ of *C. Palæo* is very pale, but a more highly coloured aberration also occurs.

The two European species of *Gonopteryx* are extremely stable, and this renders more interesting the record by Curtis, in his "British Entomology," of an English *G. rhamni* with an orange flush on the fore-wings. Had the example been a ♂, one would have concluded that some similar aberration had been the ancestor of *G. Cleopatra*, with its matchless orange-flushed fore-wings. The females of the two species are almost indistinguishable.

When we arrive at the *Lycenidae*, we find a wide field for interesting investigation, and one which is being illustrated, as far as British examples are concerned, in some valuable papers by Mr. South.

The genus *Lycæna* comprehends a multitude of species on the Continent, many of which closely approximate, while their varieties often present very analogous characters. The females of two or more species are often almost indistinguishable, although the males are strongly characterized. *L. Icarus*, for example, has usually a dull brown ♀, extremely like that of *bellargus* (*Adonis*); but sometimes in England, and very frequently in Ireland, it is almost as blue as the ♂, but with a lovely border of large orange lunules on both wings. It would be of much interest to ascertain in what districts this form crops up, as it possibly depends on climatic influence. An exactly parallel ♀ dimorphism occurs on the Continent with *L. bellargus* (*Adonis*), (ab. ♀ *Ceronus*), and this I think exemplifies the rule pointed out by Darwin, that kindred species often exhibit homologous variations. The ♂ *Icarus* also occasionally approximates to its cousin *bellargus* (*Adonis*), in having almost as brilliant an azure blue, and I have seen specimens in which the rudiments of a chequered fringe existed, and not very rarely eye spots are to be found on the border of the hind-wings. Mr. Jenner Weir has called attention to the increased breadth of the black apex of the fore-wing of *L. Argiolus* ♀ in its second emergence. In the south of Europe this character seems constant, suggesting a climatic origin. We see similar phenomena displayed in many other *Rhopalocera*, whose summer form in North and Central Europe is the only one known in the extreme south, and it has been stated by a trustworthy authority, that in excessively hot summers, characters usually peculiar to certain butterflies in the most southern European latitudes have been developed in Central Europe.

These and similar facts are of very great interest, and should be carefully observed and noted. Among other details worthy of attention are the proportional development of "tails" at the anal angle of the hind-wings of *Polyommatus Phlaeas*, and the genus *Thecla*. It seems exceedingly probable that coincident with the attainment of the most vigorous conditions under the sunny southern skies, these appendages are prolonged. Thus we find Italian specimens of *P. Phlaeas* (which in England possesses only rudimentary tails) adorned with well-marked filaments of this description. In tropical and sub-tropical countries some species of *Lycenidae* have them of prodigious length, and there seems some reason to think that these adornments have been developed from tail-less ancestors, for in some cases the ♂ alone is tailed.

Certain of the genus *Thecla* are characterized in the ♂ by a peculiar scaleless membranous patch at the extremity of the discoidal cellule of the fore-wing. This peculiarity has suggested a subdivision of the genus. Occasionally, however, examples occur in which this mark is almost wholly absent. Such aberrations should be looked for. There are numerous traits of variation noticeable among well-defined species of other genera, the occurrence of which point to convergent lines of ancestry. Take, for instance, the apical ocellus common to most of the *Satyridae*. In *E. Janira* we find a more or less double ocellus with a single pupil usually, but I possess examples, chiefly ♀, in which this apical ocellus is bi-pupilled; just like the species *Tithonus*, *Ida*, and *Pasiphæa*, which otherwise are abundantly distinct; the females, however, of the first two being closely approximate. I have also seen a ♂ *Janira* with two ante-marginal spots on the fore-wing, besides the ocellus at apex.

The *Erebidae* constitute, on the European Continent, a most interesting group of variable Satyrs. The true *E. Epiphron* is said to be only found here in its degenerate form (or is it rather the pristine type?) *Cassiope*. It may be possible, however, that examples of the type may also occur. It is noteworthy that very interesting phases of oromorphic and pediomorphic variation are shown among this genus, the colour and markings being affected by altitude, and also in some cases the contour of the wings! Here, again, sexual divergences seem to suggest some indication as to the genesis of species, the females of several species retaining a rounded contour of wing, which, in one or two species, is common to both sexes occasionally at great elevations. Of *Canonympha* likewise we have but two representatives in Great Britain, and the larger of the two is notably variable. Its pale non-ocellated form seems to occur as an aberration with the type in Scotland and elsewhere, but I do not know if it is found alone, as a local variety, in any part of the United Kingdom. Between it and the dark brown Yorkshire *Typhon* with numerous and large ocelli there exists every grade of pattern. In *C. Arcanius*, and in a less degree in one or two other species, we find an exactly parallel variation to that of *Typhon*, in regard to the development of the ocelli and band of under-side of hind-wings.

The foregoing observations will serve to show that the British entomologist who collects varieties merely for the sake of their beauty or unique character, is neglecting a branch of the subject which is of extreme interest.

A paper by Mr. Dobree, in the "Entomologist" of February,

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shows what interesting questions offer themselves to our notice on a careful comparison of British and Continental *Heterocera*. But few, however, have private collections of this kind, and until adequate provision is made in the public museums, little advance will be possible.

Kingstown, Ireland :

February, 1887.

DESCRIPTION OF THE LARVA OF *SCOPARIA RESINEA*.

BY G. T. PORRITT, F.L.S.

On the 12th May last, I received from Mr. Eustace R. Bankes a few larvæ of a *Scoparia*, which proved to be this species, and which he had found feeding under lichens and moss growing on ash trees at Corfe Castle.

Length, half to five-eighths of an inch, and of the usual *Scoparia* form : body cylindrical, of moderate bulk, and attenuated slightly at the extremities. Head, with the frontal and anal plates highly polished, and the large round tubercles also glossy : the tubercles, together with the deeply cut segmental divisions, and a slight transverse ridge on each segment, give to the skin a wrinkled appearance.

The ground-colour is a sort of greenish-yellow, very similar indeed to the colour of the lichens on which the larva feeds ; head, plates, and tubercles very dark bronzy-brown ; the front pair of tubercles on each segment are larger, and closer together than the hind pair ; and in young specimens the front and back tubercles on each side appear to join, and so form distinct, dark, bronze, oblique streaks. When the larva is crawling, the dark green alimentary vessel shows through at the segmental divisions, as the dorsal stripe, but there are no perceptible sub-dorsal or spiracular lines.

Ventral surface and prolegs of the same colour as the ground of the dorsal area, the legs ringed with darker.

I found the first imago out on June 30th, and others appeared at intervals afterwards. During the second week in July Mr. Bankes wrote me my specimens had appeared well up to time, as the species was then common with him on *apple* trees in an orchard.

Huddersfield : *March 3rd, 1887.*

A NEW GENUS OF *PIERINÆ* ALLIED TO *APPIAS*.

BY ARTHUR G. BUTLER, F.L.S., F.Z.S., &c.

Whilst re-arranging our collection of *Pierinæ* last year, I carefully re-examined the structure of the whole of the species, and thereby discovered that amongst the forms previously associated under the generic name of *Appias* (= *Tachyris*, Wallace), characterized by

the males having a brush of hairs between the anal claspers, there were a number of species in which the females also had the last segment of the abdomen furnished with a similar brush; the species of the latter group are confined to Tropical America, Madagascar, and Southern Africa, and to them I give the name of *Glutophrissa*: though in other respects so like *Appias*, that it is hardly worth while to characterize the genus at length, I believe it to be a perfectly natural group, the whole of the species of which exhibit considerable uniformity in form and pattern.

GLUTOPHRISSA, gen. nov.

Affine Appiadi, abdomen autem feminarum subitus penicillo curvato instructum, vena quoque alarum anticarum radialis superior cellula discoidali plus approximata. Gen. typ., G. Poeyi.

The named species in the Museum collection stand as follows:—

1. *Glutophrissa Poeyi*, Butl. St. Domingo, Honduras, Quito.
2. " *Molpadiia*, Hüb. Jamaica.
3. " *Margarita*, Hüb. Panamá.
4. " *albunea*, Dalm. Brazil (Rio Janeiro).
5. " *Drusilla*, Godart. Honduras.
6. " *Castalia*, Fabric. Brazil.
7. " *flavida*, ♀, Mabille. Madagascar.
8. " *Saba* (δ = *matuta*), Fabr. Ashanti, Old Calabar, S. Leone.
9. " *Malatha*, Boisd. Madagascar.

Allied to the last two species is one from Natal, which appears not to have been named, but which I believe to be a constant type, perfectly distinct from the Malagasy and West Coast forms; at any rate, it would be surprising to find that a southern form exhibited great variation in pattern, whilst its western representative remained absolutely constant in this respect; I have seen a considerable number of examples of *G. Saba* from Old Calabar, and the differences between them were quite insignificant. Several mistakes have been made in sexing *G. Saba*, its true male is the *Pieris matuta* of Doubleday, which comes in every collection with it. *P. orbona* (which has been supposed to be its male by Messrs. Mabille, Saalmüller, and others) is a *Pinacopteryx*, close to *P. Larima* and *P. alba*, and, doubtless, has a female of the *Gonoris rapæ* type, like all the other species of *Pinacopteryx*.

British Museum:

February, 1887.

Early appearance of Anthophora pilipes, Fab.—On the 25th of this month I saw a male of this bee flying round the yellow crocus in a garden in Wotton-under-Edge. On the 27th I saw several of the same sex on the same flowers, and boxed one for the sake of the early date. Last year the first seen was on April 3rd, which is late. The usual time of appearance here is about the middle of March. No doubt, should the present sunny weather continue, it will be out in numbers in a few days.—R. C. L. PERKINS, Lisle House, Wotton-under-Edge: February 28th, 1887.

SUPPLEMENT TO ANNOTATED LIST OF BRITISH *ANTHOMYIIDÆ*.

BY R. H. MEADE.

(Continued from page 181).

LIMNOPHORA, Desv.**L. ALBIFRONS**, Rond., non Zett.

This species differs from all the other true *Limnophora* with which I am acquainted by having yellow tibiae. Rondani knew only the male, I have had the pleasure of finding the female, which agrees very closely with Rondani's description, but differs in a few points, which I will now give. In the male only the four posterior tibiae are yellow, the front ones being black with yellow bases. In the female all the tibiae are entirely of a clear yellow colour. In the male Rondani says that the thorax is grey and immaculate (*unicoloria*) ; in the female it is grey, very pale in front and on the sides, and marked on the dorsum with several short black stripes or marks. The abdomen of the female, like the male, has each segment marked by two large spots, which in my specimen are subquadrate in form.

The head in the female has the eyes separated by a space which occupies about one-third of the width of the head, it is deep black, quite straight on the sides, and has a spot on the forehead with a stripe on each side white, like the face.

Rondani does not give the size of the male ; my female specimen measures about 4 mm. in length.

I captured a single female of this well-marked and interesting species at Conishead Priory, near Ulverston, Lancashire, on August 2nd, 1886.

L. SOLITARIA, Zett.

This species was placed in my list in the genus *Cænosia*, but upon close examination I find that it possesses the true characters of a *Limnophora* ; thus, the eyes of the male, though rather widely separated, are still nearer together than in the true *Cænosia*, the space between them not measuring more than a fourth or a fifth of the width of the head, while in the *Cænosia* it will measure at least a third ; besides this, there is another and more important character of distinction, for the inner sides of the eyes in the males are convex in this species, as in other *Limnophora*, being nearer together in the centre than they are above and below ; while in the *Cænosia* they are straight, leaving the intraocular space of an even width throughout in the males, as is the case in most female *Anthomyiidæ*.

HYDROTÆA, Desv.**H. SIMILIS**, sp. n.

Mas, niger nitidus ; thorax in fronte breviter albo striatus ; abdomen albidum-pallinosum, parce fuso-tessellatum, linea longitudinali tenui nigra ; oculi nudi sub-contigui ; ale basibus marginibusque anticis fuscæ, venis longitudinalibus 3tis et 4tis inflexis ; femora antica subtus bituberculata ; tibiae antica imbarbata ; tibiae posticæ callo tomentoso apicali destitutæ. *Long., 9 mm.*

This species bears such a close resemblance to the common and well-known one, *H. dentipes*, that I shall very briefly describe it, chiefly dwelling upon those points in which it differs from that species.

The colour is somewhat of a blue-black, while *H. dentipes* has a brown tinge ; the fly is also rather larger than that species, and the eyes of the male are rather nearer together, being sub-contiguous. The thorax is more distinctly striped. The abdomen, when viewed horizontally from behind, is entirely of a glistening white colour, but shows a few dark tessellations when looked at from above or in front. There is a longitudinal dorsal stripe, which is narrow and quite straight, and not interrupted or dilated in the middle or at the edges of the segments, as is usually the case with the stripe in *H. dentipes*. The legs are long, the hind femora reaching to the end of the abdomen. The fore femora have one rather short, stout, but sharp pointed tubercle or tooth beneath their anterior extremities towards the outer side, and a blunt tubercle placed a little further back on the inner side of it. In *H. dentipes*, though the species is called unidentate, there are really two teeth lying close together and parallel with each other. The fore tibiae are thicker and less indented than those in *H. dentipes*, and destitute of the little tuft of hair on their ends, which are so characteristic of that species. The middle femora have a much smaller and thinner tuft of hairs at their bases on the under and anterior surfaces than those which are found in *H. dentipes*. The middle tibiae are armed much in the same way as I have described those of *H. dentipes* to be in my list. The hind tibiae have no tubercle or callosity at their inner extremity, and also differ from those of *H. dentipes* by having a group of strong bristles in the middle of their anterior or under surfaces.

The wings are brown or nigrescent at their bases, and along their front halves ; the third and fourth longitudinal veins are rather more convergent than in *H. dentipes*, the fourth especially being more bent. The external transverse veins are rather more oblique and sinuous than those of *H. dentipes* usually are. The calyptra have the scales rather larger than those in *H. dentipes*, the under one projecting further beyond the upper one ; they are also surrounded by a darker yellow rim. The *Halteres* have light stalks and brown heads. The female is unknown to me.

I found two males of this fly at Douglas, I. M., in June, 1885, in a plantation at the back of the Castle Mona Hotel, along with numerous specimens of *H. dentipes*.

H. IMPEXA, Loew.*

I found a single male of this pretty species at Windermere in June, 1884, and have met with it since near Bradford ; I have also received specimens from other parts of England, and at the beginning of August, 1886, captured several of both sexes near Ulverston, Lancashire.

It is a well-marked species, about 6 mm. in length, of a shining black colour, with the thorax unstriped, but the abdomen with grey reflexions and a narrow dorsal stripe. The eyes are bare, and contiguous in the male, the third and fourth longitudinal veins of the wings are straight and nearly parallel. There is a peculiar grey patch of very minute microscopic hairs running across the wing just in front of the external transverse vein, and extending to the posterior border, this is absent in the female. Another characteristic feature in this species, is the presence in the male of a group of strong blunt black spines on the under surfaces, of the middle femora, near their bases.

The females are rather smaller than the males, but like them shining black.

HOMALOMYIA, Bouché.

H. FUSCULA, Fall.

This species is undoubtedly synonymous with Meigen's *H. floricola*. Fallén's description of the male of *H. fuscula* agrees with Meigen's description of the same sex of *H. floricola*, but not with Meigen's account of *H. fuscula*. The latter author seems to have applied Fallén's name to an entirely different species, for he says in his description of *H. fuscula* that the abdomen of the male is short, whereas it ought to be oblong (länglich), as he correctly states it to be in his description of *H. floricola*. He also says that it shews brown reflexions, which are not present in the latter species. Lastly he states that in the female of *H. fuscula* (that of *H. floricola* was unknown to him) there is a wide frontal stripe, whereas it is a characteristic feature of this species that the space between the eyes in the female is unusually narrow; not much more than double the width of that in the male.

Fallén's name being the oldest must supersede that given by Meigen, and the synonymy of the species will therefore stand thus—

H. FUSCULA, Fall. et Zett.

floricola, Meig. et Schiner.*cilicrura*, Rond.

H. SPISSATA, Meade.

My friend Mr. Verrall has pointed out to me that this species was described by Loew under the name of *H. coracina*,* before the part of my annotated list appeared, in which I recorded it as a new species, I therefore hasten to make the correction.

The name of *spissata* must therefore sink into a synonym, thus—

H. CORACINA, Lw.

spissata, Mde.

H. ROSEII, Rond.

Mr. Verrall has recorded the capture of this pretty little species in England,† and kindly gave me two specimens. The male has the thorax of a shining metallic brownish-black colour, with white sides and shoulders. The scutellum is brown with a reddish margin. The abdomen is of a clear transparent whitish yellow colour at the base, and black at the apex. The legs, with the exception of the tarsi, are bright yellow.

H. TRIANGULIFERA, Rond.

On carefully examining the small specimens of *Homalomyia*, which I had placed together under the name of *H. serena*, I found that they consisted of two distinct species, nearly allied, but presenting several decided points of difference. One of these I now propose to place under Rondani's name of *triangulifera*, as his description agrees with it more closely than that of any other species that I can find, with the exception perhaps of *H. lugubrina*, of Zetterstedt; and also because the name is very appropriate; one of the most distinguishing characters being the presence of three very well defined triangular spots on the dorsum of the abdomen.

The male is of a shining black colour on the thorax, the shoulders and sides

* Berliner Ent. Zeit., xviii, 47.

† List of a hundred new British species of Diptera, Ent. Mo. Mag., vol. xxii.

being marked with white; the eyes are sub-contiguous; the abdomen is of a glaucous-white colour, with black triangular marks. The middle femora are armed beneath with long and strong spines, which are grouped together, somewhat into the form of a tuft, towards the centre. The middle tibiae are ciliated along the whole length of their under surfaces with stiff hairs, which gradually increase in length towards the extremity. The hind tibiae have only a few irregular bristles on their outer sides, and no long hairs on their outer ones. The wings are fuscous. The female is like the male in colour, the thorax being black, and strongly marked on the sides with white; the abdomen is brown, shining, and immaculate. The length is about $3\frac{1}{2}$ mm.

This species is not uncommon. It is rather larger than *H. serena*, has a more glaucous abdomen, with more distinct triangular marks; it is of a blacker colour, the legs being quite black; the middle legs are more strongly armed with spines and hairs; the transverse veins of the wings are rather farther apart, and the axillary vein is longer and more curved, curling round the extremity of the anal vein.

H. NIGRISQUAMA, sp. n.

Mas, thorace ex toto nigro-nitido; abdomine cinereo micante, linea dorsali nigra, fasciisque transversis nigrescentibus obscuris; oculis nudis maximis, contiguis; alis brevibus fuscis; calyptis atris; halteribus flavescentibus; pedibus simplicibus nigris.
Long., 4 mm.

Head rather wider than the thorax, the sides being entirely covered by the eyes, which are large, bare, and contiguous.

Thorax shining black, without any signs of white on the shoulders or sides.

Abdomen rather wide, conical and flattened, without projecting anal appendages; it shows grey and black reflections, when viewed from behind, and has a longitudinal black dorsal line, which is interrupted at the sutures, but not dilated into definite triangular spots, as in many species in this genus; when viewed in certain lights, however, brown or black ill-defined patches shew themselves across the middle of the segments.

Wings short and sub-nigrescent.

Calyptra have the scales of moderate and unequal sizes, and of a brownish-black colour.

Halteres bright yellow.

Legs quite black, and simple, showing no special armament or structure, with the exception of there being two little tufts of short bristles which project one on each side from the under surface of the ends of the middle femora.

I have only seen two examples of this well-marked little species; one was captured on July 7th, 1882, near Bicester Oxon, and the other at Conishead Priory, near Ulverston, on August 2nd, 1886. I do not know the female.

(To be continued).

DESCRIPTION OF A NEW SPECIES OF *ELACHISTA* ALLIED TO
RHYNCHOSPORELLA, STN.

BY H. T. STAINTON, F.R.S.

Elachista scirpi, n. sp. Exp. al., ♂, $4\frac{1}{2}$ lin.; ♀, 5—6 lin.

Head and face grey or whitish (not so white as in *rhynchosporella*).

Anterior-wings white, much suffused with grey, especially below the costa and towards the inner margin; these grey markings have, however, no definite outline

(therein differing from *rhynchosporella*), but have a powdery appearance; a blotch of this character lies on the inner margin near the base, and another on the middle of the inner margin; above this latter is a short black dash in the fold; beyond the black dash the powdery scales form an obscure angulated fascia (very different from the more definite mark in *rhynchosporella*, which may be compared to a prostrate V), beyond this are more powdery scales towards the costa, and others along the hind margin; cilia pale grey, intersected by a dark grey line, in, or before, which at the apex is a minute black dot (more perceptible than any thing analogous which we find in *rhynchosporella*).

In *rhynchosporella*, the costa to beyond the middle is more decidedly and broadly dark than in *scirpi*; yet there is no denying the fact, that though the insects *look* different, it is by no means easy to define them by sharp characters.

This insect was first sent to me by Mr. Barrett in 1875, he having met with it in a salt-marsh near Pembroke, where he collected it again more freely in 1876; it seemed to frequent there a short species of rush. Mr. W. H. B. Fletcher has now bred it freely from larvæ collected in the leaves of *Scirpus maritimus* near Worthing, and by the help of his bred specimens, I have been able to sketch out the characters above given, Mr. Fletcher having also kindly given me his ideas as to the points of distinction between the two species.

Mountsfield, Lewisham, S.E.:
March 14th, 1887.

On the life-history of Elachista scirpi.—While staying in the New Forest in June, 1883, the Rev. C. D. Digby told me that in the previous summer he took in the Yarmouth Marshes specimens of an *Elachista*, which he thought might be of an undescribed species. Accordingly, about the middle of the month, we went together to the Isle of Wight. In the evening we found the insect flying in swarms at intervals between 5.30 and dusk. So abundant was it, that although towards the end of the flight I only boxed good specimens, I set one hundred, all males, the next morning before breakfast. In April, 1884, I searched among the herbage for the larvæ. At the south end of the Marsh there was growing on a little mud bank, so that one could place the leaves between one's eyes and the sun, what I then took for a fine-leaved grass, but now believe to have been *Juncus Gerardi*. In some of these leaves were small *Elachista* larvæ, from which resulted a few *E. cygnipennella*, and a dwarfed male of *E. scirpi*. Neither Mr. Digby nor I was able to make much more of this clue until May, 1886, when, while collecting larvæ of *Bactra* in a ditch near Worthing, I found some *Elachista* larvæ in the leaves of *Scirpus maritimus*, which proved to be those of our old Yarmouth friend. The mines are short and broad, and usually placed in the upper half of the leaves. The larva bores upwards or downwards, depositing its "frass" in long dark masses in the middle of the mine, and at the end of it opposite to that at which it feeds. The empty part of the mine is pale greenish-white, and very conspicuous.

The following description of the larva was taken on May 25th:—Length, $\frac{1}{2}$ -in.; tapering posteriorly; head pale yellow, dark brown about the mouth; body pale

greenish-yellow, with indistinct dorsal line ; there is a row of indentations on each side of the latter ; the lateral skin-fold marked out by larger indentations above and below ; segmental divisions distinct. The larvae pupate on silken pads, which are often spun on the midrib of a leaf of the food-plant. The moths began to emerge in captivity on June 15th. The species is obtainable over a long period, for I see that I took three moths on June 10th, several larvae and two moths on June 16th, and larvae, pupæ, and moths on July 3rd. I failed to find any larvae in 1886 in leaves of *Juncus Gerardi*, but feel sure that in this neighbourhood also they feed in this plant, as the moths were abundant among it at some distance from any *Scirpus*.—W. H. B. FLETCHER, Fairlawn House, Worthing : *March 7th, 1887.*

Ephestia Kühniella, Z., in *England*.—Seven years ago the late Professor Zeller sent me specimens of an *Ephestia* which he had just described (Stett. Ent. Zeit., 1879, pp. 466—471) under the name of *Kühniella*, he having received larvae in 1877 from Dr. Kühn, of Halle, who had found them in a mill there, in which much American wheat was ground. On the wheaten flour the larvae fed, and, according to the miller, they were particular in their tastes, and would not eat the rye-meal.

With the moths Professor Zeller sent living larvae, explaining that I should have no difficulty in breeding as many of the moths as I pleased. Following his directions, I placed the larvae in close-fitting boxes, in which I had put some soft paper, some bran, and plenty of wheaten flour. The larvae burrowed among the bran and flour, eating the latter, and forming loose passages of web until full fed, when they spun up among the paper, and the moths emerged in July. They appeared quite contented, and duly laid plenty of eggs, from which a second brood appeared in (I think) October or November. From the eggs of these the next brood appeared in the following summer, the only attention paid them in all this time being the occasional addition of a little flour. When, in the autumn, the offspring of this third brood went on contentedly feeding up in the same boxes, I felt I had carried the experiment far enough. I had satisfied myself that if introduced the species would flourish, increase and multiply, and it seemed possible that if moths or larvae were to escape, I might be the unwilling means of introducing a mischievous pest. I therefore destroyed all the larvae I had. I find now that (as indeed might be expected) this species, which had reached Germany ten years ago, has probably been established in this country for at least half that period. It has spread widely on the continent, and a very exhaustive account, with a beautiful plate, is given by Snellen in *Tijdschr. Ent.*, 1885, p. 237, pl. viii. Mr. William Thompson, of Stoney Stratford, sent me a few days ago, under the name of *ceratoniae*, specimens which undoubtedly belong to *Kühniella*. He tells me that he reared them from larvae found in abundance among rice cones (which appear to be a mixture of ground rice and wheat meal), on the premises of a baker in his own neighbourhood. The material was brought from a warehouse in a neighbouring town, but whence previously obtained could not be traced. The moths, had however, been noticed sitting on the meal-room walls from time to time for three or four years. Having, therefore, made good its footing with us, there is little prospect that the species will die out, but from its highly domestic habits, and the universal necessity for its pabulum, it is more likely that it may in time become, like *Pyralis farinalis*, a common domestic pest.

Epehestia Kühniella is the size of *flocella*, pale grey, much dusted with dark slate-grey. The first line blackish, indented, and, above the dorsal margin, deeply angulated, as in *Myelois ceratonia*. Second line deeply angulated near the costa, and indented below. Between these two lines is a black curved streak along the apex of the discoidal cell, but, in many specimens, this is very indistinct. In well-marked specimens there is a black line from the costa, just beyond the second line, and parallel with it for a short distance. This, which is very oblique, points towards the discal streak, and beyond it to a dark cloud on the dorsal margin near the middle, and gives the appearance of a central shade or cloudy fascia from the costa, near the apex, to the dorsal margin near the middle. The hind margin is dotted with black, the cilia are grey. Hind-wings, glossy white with brown veins and hind margin.

This species may readily be separated from our other species of *Epehestia* by its deeply indented first line, even when the oblique shade is not conspicuous, from *Myelois ceratonia* by its narrower fore-wings and far more slender thorax and abdomen.—CHAS. G. BARRETT, King's Lynn, Norfolk : March 14th, 1887.

Aporia crataegi in Devonshire.—I believe there are only two records of *A. crataegi* from the county of Devon, of which one rests on a dealer's statement. My friend, Dr. Jordan, once saw in a dealer's collection at Exeter specimens of this insect, and asking where they were taken, was told that they came from Moreton Hampstead. The other record comes from Canon Tristram. Knowing that he had taken *crataegi* at Torquay, I wrote, asking him for details. This reply is so interesting and important that, with his permission, I here give it verbatim.

"I was at Torquay in ill health in the spring and summer of 1854. In the late spring or early summer I came across numbers of this butterfly in one field, a grassy slope, with steepish banks adjoining a wood. I think it was what they called the Castle Hill, but I have never been there since, and my memory is not clear as to this. I never saw the insect except there, I did not come across it anywhere else. It is the only time or place I have ever seen it in England. I do not think it lasted many days, and I should say all I captured were in the same field. I filled a store box I know, and for some years supplied my friends from it. I have still a nice row of them, but I have long ceased to add to my collection, and was quite unaware till I received your letter that there was any special interest attaching to *A. crataegi*. Can it have been a sudden outburst not usual at that place, like my getting eleven *Vanessa Antiopa* on one geranium bed in a friend's garden in Norfolk before breakfast one morning? I had no entomological acquaintances at Torquay, so I assumed this to be a normal occurrence. I may add I took on the shore there a fine specimen of *D. pulchella* about the same time, and succeeded in hatching and rearing the eggs on Marvel of Peru."

In Loudon's Magazine of Natural History, vol. iii, p. 247, I find the following notice of this butterfly :—

"1826—*Papilio crataegata*, black ribbed butterfly, is rather a local insect. In the previous summer I met a scientific tourist from Suffolk, who informed me that he had visited Hants to procure this insect, which he understood was here plentiful; we searched for it several days to no purpose, but this year they were more numerous than even the common Cabbage White, abounding in every field; since then very scarce."

These cases point very strongly to migration as the cause of the abundance of this species; its occurrence at Torquay being an almost isolated instance of its appearance in Devon. The only inference that can be drawn from these facts, and those already brought before us, is that, after trying to establish itself in this country, it succeeded in holding its own for a few years, but, eventually, found the climate unsuitable, possibly too humid, and, therefore, gradually succumbed.—G. T. BAKER, 16, Clarendon Road, Edgbaston : *March 16th, 1887.*

Is Aporia crataegi extinct in England?—Mr. Tutt, in his notes on this subject (*ante*, pp. 220, 221), suggests “that migration lies at the bottom of the probable cause of the great falling off observed in the number of this species.” By this, I understand Mr. Tutt to mean that the same conditions of the climate of this country, which have been unfavourable to the development and increase of indigenous specimens of this species, and have tended towards its rarity or extinction, have also prevented its recruiting its numbers by migration, or rather immigration, from the Continent. The absence or existence of climatic conditions favourable to immigration, is, no doubt, the cause of the rarity or abundance, in any year or succession of years, of *Colias Edusa*, *Colias Hyale*, *Vanessa cardui*, *Sphinga convolvuli*, and other migratory and cosmopolitan species, but *Aporia crataegi* cannot, I think, be placed in the same category as these, and before we can entertain the hope that it “will become common again” when “we get a fresh stock from the Continent,” it is necessary that some evidence should be forthcoming that it is migratory in its habits. According to my experience, *Aporia crataegi*, although a powerful flyer, and capable of soaring to a great height when pursued or alarmed, is usually a gregarious and sluggish insect, occurring chiefly in colonies, in the immediate neighbourhood of the trees or shrubs on which it fed in its larval stage, and in this respect resembling species of the genus *Melitaea*. If *A. crataegi* is migratory in its habits, why do we not occasionally hear of its capture in Kent, and other parts of the South East of England, in those seasons when a larger number than usual of such species as *Pieris Daplidice*, *Argynnis Lathonia*, and other immigrants from the Continent occur? As it is an abundant species in many parts of the Continent of Europe there ought not to be any difficulty in ascertaining from Continental Lepidopterists whether or not it is migratory in its habits.

With reference to the concluding remarks of Mr. Tutt, I fail to see how the prejudice to Continental types of British species, which may possibly still be entertained by *some* collectors of British *Lepidoptera*, can affect the consideration of questions concerning the geographical distribution or migration of species.—H. Goss, Surbiton Hill : *March, 1887.*

[We shall be glad of precise information on the point raised by Mr. Goss. At present we are disposed to agree with him to the effect that *A. crataegi* is not a migratory species, and think that any hope of resuscitating it in this country must rest on artificial introduction and perfect abstention from “collecting” for a long time. Not believing, *as a rule*, in extermination by collectors, we are, nevertheless, disposed to think that “over-collecting” may have played a prominent part in the disappearance of this butterfly, viewed in connection with its gregarious habits in its earlier stages (which rendered it an easy prey to wholesale collectors) and its “localization” here. But we are compelled to adopt the idea that the decadence of

many of our butterflies is mainly due to undefined natural causes. Stephens, in his "Illustrations" (*Haust.*, i, p. 27, 1827) says, that in June, 1810, he saw *A. crataegi* in plenty in Coombe Wood, and that on the following year he captured several at Muswell Hill, but had since never seen it at large, and he adds that Mr. Haworth used to constantly take it at Chelsea. The "Cabbage Whites" are notoriously migratory, and immigration no doubt frequently recruits our already too-abundant supply.—[Eds.]

On the life-history of Depressaria ciniflonella, Z.—In March, 1885, I received from Mr. Salvage, then collecting at Rannoch, some living females of this species, with the information confirming a previously formed guess of my own, that the larvæ would be likely to eat birch leaves. One of these moths laid about a dozen eggs, the greater part of them in a row along the crevice between a birch bud and the twig on which it grew, fastening them to the scales of the bud. When I first saw these eggs they were very bright red, and became, a few days before hatching, dark smoky-purple in colour. The young larvæ appeared during the last half of April, and took readily to birch, *Betula alba*. The following description was taken on May 12th:—

Length, about $\frac{1}{2}$ -in., tapering towards both ends; head dark brown; corselet almost black, bisected by thin median line; anal segment with black plate, and large black spots on anal claspers; body, dull sage-green, the spots large with black bristles.

On May 25th, being about full-grown, they were again described, thus:—

Length, about $\frac{3}{4}$ -in.; head pale reddish, marked with dark brown about the mouth; corselet and anal plate blackish; body purple-brown, rather lighter anteriorly; spots, large and black. By June 8th the larvæ had pupated. The pupa is about $\frac{1}{2}$ -in. long; the colour of the body red, that of the wing-cases olive-brown, with a greenish tinge.

The larvæ live in a tube open at both ends, formed by turning down a piece at the edge of a birch leaf, or by folding one down the middle. The moths emerged towards the end of June, and were, on the average, larger than wild specimens from the same locality, from which I conclude that birch is almost certainly the natural food-plant of the larvæ.—W. H. B. FLETCHER, Fairlawn House, Worthing: March 7th, 1887.

Remarkable variety of Eudorea pyralella.—In the end of June, 1886, when collecting on our Isle of Purbeck coast, I was fortunate enough to meet with four examples of a most beautiful and striking variety of *Eudorea pyralella*. The fore-wings are pure white, and, with the exception of a few coloured scales at the base, and a small wedge-shaped blotch and dotted line at the extreme hind margin, the only markings are contained between the first and second lines, and are of the usual type and colour: the space enclosed by these lines shows out against the clear white ground colour as a well-defined and conspicuous central fascia. There is not the faintest trace of any subterminal band.

Between the typical *E. pyralella* and this extreme form, which exactly corresponds to, but is even whiter than, the very whitest examples of *E. frequentella*, var. *portlandica*, the local coast variety *ingratella* is an intermediate link.

These four specimens of this pale variety were all I could meet with out of numbers of the usual type.—EUSTACE R. BANKES, The Rectory, Corfe Castle: February 24th, 1887.

Notes on Sesia philanthiformis in West Cornwall.—During my short stay at Penzance last summer, I had more than one opportunity of observing the habits of this interesting lepidopteron. My first acquaintance with it was made on the 7th of July, when I visited the Logan Rocks which are situated on the coast and not many miles distant from the Land's End. The weather, on this occasion, was marked by continuous sunshine, combined with a higher temperature than I believe is usually registered in this part of the country, but, happily, the otherwise oppressive heat was, as is so frequently the case on the coast, considerably tempered by a freshening breeze. I had not arrived at the "Rocks" long, before I became aware of the presence of several insects flitting about the herbage. These, I at first thought were small wasps or other *Hymenoptera*, but subsequently noticing that the ground was thickly covered in places with common thrift (*Armeria vulgaris*), I began to suspect that they might, on further examination, prove to be *Sesia philanthiformis*. Some time was spent, as may be readily imagined, before a specimen could be marked down, for in such a wind they seemed as it were to disappear almost magically. However, after repeated failures, I at last succeeded in tracing one of them until it settled on some short grass, and a brief glance at the individual sufficed to convince me that it was *S. philanthiformis*.

Possessing only a "type" of this species in my collection, I naturally became anxious to secure specimens, but not having a net with me, I found this a difficult matter. Therefore, at the risk of rendering the specimens worthless, I first tried to knock them down with the hat whilst they were at rest. This procedure resulted in a miserable failure, for if I knocked *one* down, which is questionable, I certainly could never find it. After several abortive trials of this rough method, I contrived (not without many ineffectual attempts) to invert the hat over a specimen, but only again to be foiled, for on slightly elevating the hat to box the coveted object, it once more exhibited its activity and darted off. Disappointed in every way, I soon gave up all hopes of obtaining specimens, much as I wanted them. However, about 1 p.m., whilst on my way back by the fields to the village, for the purpose of driving to the Land's End, I again came across the species. This time fortune favoured me, for it was flying about in numbers on the lee-side of one of the quaint stone walls, which are so strikingly characteristic of this part of the country, serving as they do for fences. After watching the insect for a short time, I observed that although its food-plant, the common thrift, grew in plenty on the wall, it invariably settled on the flowers or foliage (principally the latter) of wild thyme. Once settled on this plant, a specimen would allow itself to be approached and looked at. It was now that I found my glass-bottomed boxes useful, and, in a very short time, I had the satisfaction of securing nine specimens. An examination of the thrift on the wall shewed evident traces of its having been tenanted by larvæ, doubtless of the same species. Upon arrival at the Land's End, *S. philanthiformis* again came under my notice, but it did not appear to be so plentiful there; perhaps it was too late in the day! A day or two afterwards I observed a few more on walls, not far from Porthcurno, and two or three were netted. But I shall ever regret that I had not the net with me on the 7th July, for by means of it, and a good supply of boxes, I am confident that I could have obtained many scores of good specimens.

From my short experience of this species, I should not be surprised if it were found to exist in all those situations on the coast of West Cornwall in which its food-plant grows in any appreciable quantity.—EDWARD A. ATMORE, King's Lynn, Norfolk: February 17th, 1887.

Notes on Ephippiphora tetragonana.—My first acquaintance with this species was made on the 9th August, 1885, when I casually met with two specimens—not in the best condition—in a wood near this town. Owing to the lateness of the season, I only obtained three or four more that year, but determined to look out for it earlier in future, and I am pleased to say that my efforts last year were rewarded with a good series. The earliest captures were made on the 18th July, when the insect was in fine condition; and I continued to meet with it till the middle of August, the condition being generally good up to the first week in that month. From observation, I should say that the best time of the day for it is from 6 p.m. to 7 p.m., when it flies rather *briskly* about two or three feet above the ground amongst the wild rose bushes, which are scattered over a considerable portion of the wood. Its flight is rather similar to that of its congeners, *E. cirsiana* and *E. bimaculana*, but still more closely, I think, resembles that of *Orthotænia striana*. Not unfrequently I watched it till it settled on a rose, or bramble leaf, but it never rested long. In the bright sunshine it flies more rapidly, and is then, from its colour, somewhat difficult to follow with the eye. Its food-plant here is, to my mind, *undoubtedly rose*, and I searched hard for the larvae last May, though without success. This year, however, I have good hopes of being more fortunate in this respect, and, if so, shall be glad to communicate the result.—W. A. ATMORE, 11, Albion Place, Grantham: *February 22nd, 1887.*

Homalota cavifrons, Sharp.—*Homalota cavifrons* occurs not uncommonly in the Pentlands in spring and autumn, and also in the Queen's Park, Edinburgh, on the under-sides of stones lying on the turf, and in moss. The males, which are easily distinguished by the wide frontal depression and the black bristles at the extremity of the abdomen, vary a good deal in colour, some specimens being much paler and more rufous than others, without, apparently, being immature. The females, which are much more like *analis*, but smaller, and with shorter elytra, are generally uniformly dark in colour. They are very active, and when two or three are on the under-surface of a stone, it is no easy matter to secure them, especially if a high wind is blowing.—R. F. LOGAN, Colinton, Midlothian: *March 11th, 1887.*

Hydnobius punctatissimus, Steph., &c., near Margate.—Upon the 8th of November last, while casually strolling along the shore, I found a few specimens of this beetle crawling upon the cliffs, and a brief search brought me to its head-quarters. Here it was in the utmost profusion, both ascending the cliff and crawling upon the sand below; so much so, in fact, that before I came away I secured nearly 500 specimens. For more than a week it continued in the utmost profusion, and even so late as the 3rd of December a specimen settled upon my hand as I was walking along.

This beetle appears to be longer than most in attaining its mature colouring. Nearly one-third of the specimens that I took were yellow or very pale brown, and some that I kept alive and exposed to the light for five days had altered little at the end of that time. At first I thought that these pale individuals might possibly belong to another species, but I can detect no structural difference, and therefore conclude that they are merely immature *H. punctatissimus*.

At the same time I also took eight examples of the pretty little *Ceuthorrhynchus frontalis*, Bris., which is rather hard to see as it sits motionless upon the cliff.

Diglossa mersa was extremely plentiful one morning—far above high-water mark—in company with *Phytosus spinifer*, but subsequently I found only two or three specimens.—THEODORE WOOD, St. Peter's, Kent: February 6th, 1887.

Wireworms in winter.—It seems to be generally supposed that wireworms descend deeply into the soil during the winter months. During the last six weeks, and even immediately after tolerably severe weather and prolonged frost, I, however, have found them feeding upon Jerusalem artichokes within an inch or two of the surface. I imagine that when food is abundant they do not trouble to descend at all, and only hibernate, strictly speaking, when it is not to be procured. Many larvæ, we know, may be frozen without injury to themselves, and wireworms are perhaps as robust as any. It is therefore scarcely likely that any but a severe frost should drive them so far below the surface when food in plenty is to be obtained; and certainly it has no such effect in the garden here.—ID.

Aphodius consputus, Cr., near Margate.—Early in last November I had the good fortune to capture fifteen specimens of this rarity, as they were crawling up the cliffs in company with a host of other insects. Not recognising them at the time, I imagined them to be a varying form of *A. prodrromus*. Upon examining them at home, however, I was at once struck by the conspicuous yellow blotch upon either side of the head, and by the yellowish centre to the metasternum; and then their true character, of course, was evident enough. In company with them I also took *A. porcus* and *A. tessulatus* in some numbers. I fancy that many of the rarer *Aphodii* appear later in the year than is generally imagined, and so escape the notice of collectors. As far as my own experience goes, shore and cliff collecting, to which I am indebted for many of my best captures, is remunerative at least until the end of November.—ID.

Obituary.

John Sang.—We regret to announce the sudden death of Mr. Sang, who was found dead in his bed on the morning of Sunday, March 20th. The cause of death was valvular disease of the heart. A detailed notice will appear in our next No.

THE SOUTH LONDON ENTOMOLOGICAL AND NATURAL HISTORY SOCIETY:
February 24th, 1887: R. ADKIN, Esq., F.E.S., President, in the Chair.

Messrs. J. E. Kelsall, J. Lea, and E. B. Nevinson, were elected Members.

Mr. Tutt exhibited *Tephrosia crepuscularia*, Hb., from Hungary, and remarked that he was unable to obtain any forms of *T. biundularia* from there although he had received it from Germany; he further showed continental forms of *Agrotidae* and specimens of *Acidalia perochraria*, Fisch., and contributed notes. Mr. R. South, *Lobophora polycommata*, Hb. (bred). Dr. Rendall, *Calocampa solidaginis*, Hb., from Cannock Chase. Mr. Tugwell, English and Scotch forms of *Lycæna bellargus*, Rott. Mr. R. Adkin, *Notodontæ ziczac*, L., *Dianthæcia capsophila*, Dup., *Aplecta prasina*, Fb., and *Eupithecia pumilata*, Hb., from County Cork, with specimens from various English localities for comparison. Mr. J. J. Weir read a paper on "Melanism." Mr. George Smith gave an exhibition of photo-micrographic slides.

10th March, 1887.—The President in the Chair.

Messrs. D. J. Rice and H. H. Druce were elected Members.

Mr. Goldthwaite exhibited *Nysia hispida*, Fb. (bred). Mr. J. W. Slater, a variety of *Arctia Caja*, L., having the red colour replaced by a yellowish or buff colour, and he stated that it had been bred by Mr. Mutch, of Hornsey, who had fed a number of larvae on lime, and the remainder on the usual food-plants, with the result that all those fed on the lime were this yellow form, the others being normal. Mr. R. Adkin, *Zanclognatha tarsipennalis*, Tr., and remarked that nearly twelve months had elapsed between the escape of the larvae from the eggs and the emergence of the imagines. Mr. Billups exhibited *Tapinoma melanocephalum*, For., taken in the Palm House, Kew Gardens, on *Hovea Grisebachia*, from Tropical Australia, and he stated that this brought the number of Exotic ants found in Kew Gardens by Messrs. Smith, Saunders, and himself, up to seven species. Mr. E. Step contributed a paper on "Mosses."—H. W. BARKER, Hon. Sec.

ENTOMOLOGICAL SOCIETY OF LONDON: March 2nd, 1887.—Dr. D. SHARP, F.Z.S., President, in the Chair.

The Rev. T. W. Daltry, M.A., F.L.S., of Madeley Vicarage, Staffordshire; Dr. Neville Manders, L.R.C.P., of the Army Medical Staff, Mooltan, India; Mr. Alfred Sich, of Chiswick; and Mr. J. T. McDougall, of Blackheath, were elected Fellows.

Mr. Slater exhibited, on behalf of Mr. Mutch, two specimens of *Arctia Caja*, one of which was bred from a larva fed on lime leaves, and the other from a larva fed on low plants, the ordinary pabulum of the species. The object of the exhibition was to show the effect of food in causing variation in *Lepidoptera*.

Capt. H. J. Elwes exhibited a large number of *Lepidoptera-Heterocera*, caught by him in the verandah of the Club at Darjeeling, in Sikkim, at an elevation of 7000 feet, on the night of the 4th of August, 1886, between 9 p.m. and 1 a.m. The specimens exhibited represented upwards of 120 species. He stated that Mr. A. R. Wallace's observations on the conditions most favourable for collecting moths in the tropics were fully confirmed by his own experience during four months' collecting in Sikkim and the Khasias. The conditions referred to by Mr. Wallace were a dark wet night in the rainy season; a situation commanding a large extent of virgin forest and uncultivated ground; and a whitewashed verandah, not too high, with powerful lamps in it. He said that on many nights during June and July he had taken from 60 to 80 species, and during his stay he had collected between 600 and 700 species. He also made some remarks on the Khasia Hills, the southern slopes of which he believed to be the true habitat of the greater part of those insects described many years ago by Prof. Westwood and others as coming from Sylhet, which was situated in a flat cultivated plain, under water during the rainy season, and not many miles distant from these hills. In consequence of the unhealthy and extremely hot and wet climate of these hills no Europeans had done much collecting there, but the specimens were chiefly caught by the natives and brought into the town of Sylhet for sale.

The Rev. W. W. Fowler exhibited a specimen of *Cathormiocerus socius*, taken a few years ago at Sandown, Isle of Wight. Mr. S. Stevens exhibited specimens of *Cathormiocerus maritimus* and *Platytaurus hirtus*. Mr. F. Grut said he was requested by Mons. Péringuey, of Cape Town, to announce that the latter was engaged on a monograph of *Hipporrhina*, and that he would be glad to receive specimens and other assistance from British Entomologists. Mr. Gervase F. Mathew communicated "Descriptions of new species of *Rhopalocera* from the Solomon Islands." Mr. George T. Baker communicated "Descriptions of a new species of the Lepidopterous genus *Carama*, together with a few notes on the genus;" and "Description of a new genus of *Rhopalocera* allied to *Thecla*."—H. Goss, Hon. Sec.

LIST OF BRITISH *TIPULIDÆ*, &c. ("DADDY-LONGLEGS"),
WITH NOTES.

BY G. H. VERRALL, F.E.S.

(Continued from page 209).

IDIOPTERA.

I am not sure that *I. fasciata*, L., is British, but think it most probable; Walker's description may apply to it, as he says nothing about the abbreviated wings of the female, but, on the other hand, he puts *I. pulchella*, Mg., as a synonym. *I. pulchella* I have taken at Lyndhurst and *I. trimaculata* at Aberdeen.

EPHELIA.

In this genus I know nothing of *E. decora*, Hal., given by Walker as a variety of *E. marmorata*, Mg., but Loew truly remarks that Hali-day's description will not agree with any known *Ephelia*. Until very recently (1863) only one very variable *Ephelia* was recognised as European, but in that year Egger distinguished *E. miliaria*, and in 1871 Loew distinguished three more (one of which I think identical with *E. miliaria*).

Our British species, exclusive of *E. decora*, are not easy to tabulate, but the following table may assist in their determination:

- 1 (4) Wing veins entirely without small dots on them.
- 2 (3) The spots at the tip of the wing sharply separated; largish species...
miliaria, Egg.
- 3 (2) The spots at the tip of the wing coalescing into a cloud, which occupies nearly all the tip of the wing; smallest species, and legs thinnest...
apicata, Lw.
- 4 (1) Wing veins with some, or numerous, dark dots on them.
- 5 (6) Dots on the veins not numerous, hence considerable open clear spaces on the wings, supernumerary cross vein with its darkening spread both ways along the postical vein; smallish species.....
submarmorata, n. sp.
- 6 (5) Dots on the veins numerous, usually leaving scarcely any clear spaces on the wings, but the supernumerary cross vein does not extend its darkening along the postical vein; largest species
marmorata, Mg.

The four species all differ in the vein which ends in the tip of the wing: in *E. miliaria* this is slightly clouded all along, except at the tip; in *E. apicata* it begins nearly clear, then runs through the large apical cloud, but finishes in a clear spot at its extreme tip; in *E. submarmorata* it varies a great deal, but is never like the preceding species, it usually has from four to six dark dots on it, and sometimes finishes in a dark dot; while in *E. marmorata* it is usually crowded with dots.

E. miliaria: not at all uncommon near the Shin in Sutherland last July, also at Inchnadamph.

E. apicata : one day, when at Inveran last July, I crossed to the Ross-shire side of the Oykel, and in a small valley this species abounded, while no other occurred ; I believe it is a species very abundant when it occurs, but occurring in very restricted localities ; I found it abundantly in a small locality near Bickleigh in Devonshire, in August, 1885, and to prove its wide distribution, I have a female caught in the Pistojese Apennines by the Rev. A. E. Eaton on August 5th, 1882. Loew described it from a wide area in Central Europe.

E. SUBMARMORATA, n. sp. (♂ ♀).—*Minor, inter E. marmorata et E. apicata sed ab hāc maculis in alarum apice sitis non confluentibus et venis longitudinalibus parce nigro-punctatis, et ab illā magnitudine minore et aliis clarioribus, distincta.*

A smallish species, resembling both *E. marmorata* and *E. apicata* ; it is not quite so small as *E. apicata*, and the thorax is not so brightly striped ; the wings are broader than in *E. apicata*, and have but few spots on the veins compared with *E. marmorata* ; the spots near the apex, though not so black and sharply defined as in *E. miliaria*, still have not the least tendency to the characteristic cloud of *E. apicata*, and the presence of some dots on the veins distinguishes it from all except *E. marmorata* ; from this its small size and the comparative scarcity of the dots on the veins at once separate it, while a peculiarity is noticeable at the lower end of the supernumerary vein, as the clouding of the vein spreads out both wings along the postical vein, giving the appearance of a T reversed ; the scarcity of the dots about the veins leaves distinct the two (nearly) clear bands across the wings which are so noticeable in *E. apicata*. The genitalia are small and dark.

This species was abundant near Tunbridge Wells and Frant last June, and I met with it at Loch Maree in June, 1885.

E. marmorata is widely spread, but seldom abounds in one spot.

LIMNOPHILA.

- 1 (18) Subcostal vein ending almost with the cross vein connecting it with the radial.
- 2 (15) Präfurca never more than twice as long as the petiole of the first submarginal cell, often only about as long.
- 3 (14) Petiole of upper vein from discal cell at least half as long as the fork.
- 4 (5) Blackish-grey species *Meigenii*, Ver.
- 5 (4) Ochreous species.
- 6 (13) Thorax with a black central line, at least in front.
- 7 (10) Stigma distinct, though not conspicuous ; species 20—30 mm. alar expanse.
- 8 (9) Wings somewhat pellucid, femora (when mature) blackish, leaving only the basal third luteous *dispar*, Mg.
- 9 (8) Wings distinctly yellowish ; femora with only the tips dark... *lineola*, Mg.
- 10 (7) Stigma absent ; species 16—20 mm. alar expanse.
- 11 (12) Discal cell closed *lineolella*, n. sp.
- 12 (11) Discal cell open *aperta*, n. sp.
- 13 (6) Thorax entirely ochreous, with no trace of a central black line... *ferruginea*, Mg.

14 (3) Petiole of upper vein from discal cell not a quarter the length of the fork (radial vein strongly arched after the *præfurca*) *ochracea*, Mg.

15 (2) *Præfurca* three or four times as long as the petiole of the first sub-marginal cell (base of *præfurca* clouded).

16 (17) Blackish-grey species *bicolor*, Mg.

17 (16) Ochreous species *punctum*, Mg.

18 (1) Subcostal vein continued a considerable distance after the cross vein connecting it with the radial (*præfurca* always long). Petiole of upper vein from discal cell (normally) from two to ten times as long as the fork (fork sometimes absent).

19 (26) Petiole of upper vein from discal cell scarcely longer than the fork, often shorter; marginal cross vein exceedingly near base of radial fork (except in *L. sepium*), base of the discal cell not in a line with the base of the two cells above, (*conf. L. nemoralis, var.*).

20 (23) Great cross vein after middle of discal cell, antennæ bearing bristly hairs three or four times as long as each joint.

21 (22) Entirely ochreous, veins at end of wing approximating *fuscipennis*, Mg.

22 (21) Disc of thorax shining dark brown *discicollis*, Mg.

23 (30) Great cross vein before middle of discal cell, antennæ bearing bristly hairs about twice as long as each joint.

24 (25) Pleuræ grey *lucorum*, Mg.

25 (24) Pleuræ yellowish *sepium*, Ver.

26 (19) Petiole of upper vein from discal cell (normally) from two to ten times as long as the fork (fork sometimes absent).

27 (28) Light grey species, usually with stripes on thorax, medium sized .. *nemoralis*, Mg.

28 (27) Thorax blackish, or brownish unstriped, small species.

29 (30) Blackish, wings narrow, almost bare *filata*, Wlk.

30 (29) Brown, wings broad and pilose, even on the disc near the tip... *senilis*, Hal.

The above sixteen species form a very natural group, with the possible exception of *L. senilis*, which, however, has all the essential characters of the genus. Two or three more species may be expected to occur in Britain, and a good deal remains to be done in synonymy, as I certainly do not agree with the continental writers in all cases; I think, however, I have completely cleared up all the British synonyms, many of which had previously been of considerable trouble to students.

L. Meigenii: the *Limnobia nigrina* of Meig., Sys. Bes., vi, 277 (1830) cannot retain its name against *Limn. nigrina*, Wied., Auss. Zw. Ins., i, 37 (1828), even though they may some day be proved to belong to very different genera (Osten-Sacken suspects Wiedemann's species to be a *Gnophomyia*, a genus near *Trimicra*), so I have called the European species *L. Meigenii*. It is a well-marked species, not at all uncommon in Britain, though it seems to have been very much overlooked on the continent. I have taken it at Lyndhurst, and in several localities in North Scotland, and at Inchnadamph it occurred very abundantly on a large flat moor.

L. dispar, Mg.: a very common species in many localities in Sussex, Kent, Hants, and Herts. I have seen Walker's original types of *L. dispar* and *punctum*, which are undoubtedly the same species. Immature examples of this species sometimes have the legs coloured almost as in *L. lineola*, but the more pellucid tint of the wings at once identifies them.

L. lineola, Mg.: this is slightly the largest British species of the genus, and may be known at once by its yellowish-tinged wings with a faint but quite distinct stigma. I have taken it in Sussex, Hampshire, and Cambridge.

L. LINEOLELLA, n. sp. (♂ ♀).—*Ferruginea, nitida; thoracis antice lineola dorsali nigro-brunnea; capite cano aliis subflavido-hyalinis, stigmate viz ullo; pedibus flavis, femoribus apice obscuris*. Long. 9—10 mm., alar. exp. 19—21 mm.

♂. Back of head blackish, covered with whitish-grey tomentum, becoming somewhat silvery towards front, and also bearing yellowish-red hairs; the antennæ are shortish, reaching about halfway down the thorax when bent back, and have the basal joint blackish, the second roundish, blackish at base but dull ochreous at tip, succeeding joints oval, becoming elongate-oval, dull ochreous working up to darkish brown, bearing bristles about as long as each joint; palpi and rostrum brownish-black.

Thorax shining ochreous, with a black central line in front.

Abdomen well clothed with reddish-yellow hairs, usually with a dark line down the sides, and rather obscure above before the genitalia, but nothing at all like the blackish band in *L. ferruginea*, ♂; the genitalia the same colour as the abdomen, bearing yellow pubescence, the genital hooks not large and still the same colour, an internal piece is black, and there are no noticeable reddish-yellow bristles on the last segment of the belly as in *L. ferruginea*, ♂.

Legs ochreous, becoming indeterminately dark towards the end of the femora and onwards, the base of the tibiae perhaps a little paler; even in pale specimens only obscure darkening and no determinate markings, while in dark specimens the darkening begins before the middle of the femora, but very indeterminately.

Wings pale yellowish-hyaline (i. e., not as yellow as in *L. ferruginea* and *lineola*), with scarcely a vestige of a stigma; veins somewhat yellowish-brown, marginal cross vein about the middle of the upper branch of the radial fork, the basal portion of the radial (= the space between the end of the pterfurca and the radial fork) about a third as long as the upper branch of the fork, the branches of the forked vein from the discal cell are almost the same length as their petiole, the last vein is very little undulating, very slightly incurved at its end. The base of the pterfurca often has a trace of a recurrent vein, and the end of the mediastinal vein sometimes runs up so abruptly to the costa, that it seems as if a cross vein united it to the costa, while it gently curved on into the subcostal vein.

♀ very similar, but the ends of the femora are more determinately blackish. One specimen caught at Inveran on July 11th, 1886, has the disc of the thorax nearly all blackish, and is altogether a very dark specimen.

This is the commonest British species, and yet I think it is undescribed, unless it should prove to be the little known *L. fulvonervosa* of Schummel, but that (according to Schiner, as I do not possess Schummel's original description) has the femora in the female, which was the only sex he knew, not darkened at the tip; besides I possess a single poor specimen which I think distinct from *L. lineolella*, and which may prove to be the true *L. fulvonervosa*.

The described European ochreous *Limnophila* are (1) *L. lineola*, Mg., Klass., i, 56 (1804), which I think is beyond doubt the largest yellow-winged species which I recognise, and which was badly described as *L. ferruginea* by Walker in I. B. D., iii, 286: (2) *L. flavescens*, Mg., Klass., i, 56 (1804); not the *T. flavescens* of earlier writers, but the same as (3) *L. ferruginea*, Mg., Sys. Bes., i, 128 (1818); I have no doubt this is my *L. ferruginea*, because of the absence of any central dark line on the thorax, though it is somewhat remarkable that Meigen does not mention the dark fascia across the male abdomen just before the genitalia; Schiner, however, mentions this, thus showing that he recognised the same species as I do: (4) *L. geniculata*, Mg., Sys. Bes., i, 124 (1818), an unrecognised species communicated to Meigen by Hoffmannsegg, and possibly belonging here; it is insufficiently described, but can hardly be any of my new species, as it has dark stripes on the thorax: (5) *L. fulvescens*, Mg., Sys. Bes., i, 127 (1818), another unrecognised species from Hoffmannsegg, with apparently an unstriped thorax: (6) *L. punctum*, Mg., Sys. Bes., i, 128 (1818), in all probability the species I recognise as British, of which probably (7) *L. glabricula*, Mg., Sys. Bes., vi, 276 (1830), and (8) *L. longicornis*, Schum., Beitr. Ent., i, 166 (1829), and certainly (9) *L. binotata*, Zett., Ins. Lapp., 834 (1837), are synonyms: (10) *L. dispar*, Mg., Sys. Bes., i, 129 (1818), undoubtedly the common species I recognise, which is described twice over by Walker as *L. dispar* and *punctum*: (11) *L. praeusta*, Schum., Beitr. Ent., i, 169 (1829), an undoubtedly synonym of *L. ferruginea*, Mg.: (12) *L. fulvonervosa*, Schum., Beitr. Ent., i, 164 (1829), which I have mentioned above: and lastly (13) *L. unicolor*, Wlk., I. B. D., iii, 289 (1856), which was described from a specimen of *L. ferruginea* which I have seen, but the figure on plate 27, fig. 2e, is from an *Amalopis*, probably *A. unicolor* of Schummel. There are, therefore, four well known and three doubtful species in Europe; the four well known species and two or three others occur in Britain, the above described *L. lineolella* being very common; it is described by Walker as *L. lineola*. I have met with it abundantly from the Channel to the North Sea (Lymington to Tongue).

NOTES ON *GALERUCINÆ*, AND DESCRIPTIONS OF TWO NEW
SPECIES OF *HISPIDÆ*.

BY J. S. BALY, F.L.S.

Genus AULACOPHORA.

Aulacophora dilatata, Jacoby :—New genera and species of Phytophagous Coleoptera in the Genoa Civic Museum, 1886, p. 51.

This insect is a pale variety of *A. luteicornis*, Fabr.

Aulacophora semiopaca, Jacoby, *l. c.*, p. 51.

One of the numerous varieties of *A. bicolor*, Weber.

Since the publication of my paper on *Aulacophora* in the Linnean Proceedings, I have seen a series of this species, in which there is a distinct transverse depression below the basilar space; it is probably the most variable insect in the genus.

Genus MALAXIA.

Fairmaire, Ann. Soc. Ent. France, 5^e ser., viii, p. 139.

The above genus, formed by M. Fairmaire on a species from Central China, has since been re-characterized by Mr. Jacoby in Notes Leyd. Mus., vi, 1884, p. 62, under the name of *Glytolus*. M. Fairmaire, in his diagnosis, has given the claws as bifid, with the inner tooth short. Mr. Jacoby (more correctly) has described them as appendiculate.

1. *Malaxia flavovirens*, Fair., *l. c.*, p. 139, China. I possess several specimens of this species from various parts of China; in some the thorax and legs are stained to a greater or less extent with fuscous or black; one of these specimens M. Fairmaire has kindly compared with his type.
2. *Malaxia viridis* :—*Glytolus viridis*, Jacoby, *l. c.*, p. 62. Sumatra.

Genus SERMYLOIDES.

Jacoby, Notes Leyd. Mus., vi, 1884, p. 64, = *Præochralea*, Duvivier, Stett. Ent. Zeit., xlv, 1885, p. 245.

The present genus, as seen above, has been twice characterized, in the first place by Mr. Jacoby, secondly by M. Duvivier; both authors having taken the same insect for their type, there can, however, be no doubt but that this species had been previously described by Fabricius, under the name of *pallicornis*: the synonymy stands thus:—

Sermyleoides pallicornis, Fabr., Sys. El., i, p. 483 (*Galeruca*).

- A. Elytris fulvis, margine exteriori apiceque nigris.
- B. Elytria fasciâ lata basali nigra, cæteris ut in A. *Sermyleoides basalis*, Jac., l. c., p. 65.
- C. Elytris totis fulvis. *Præochralea antennalis*, Duv., l. c., p. 245.

Hab. : A and B, Sumatra ; C, Philippine Islands.

Mr. Jacoby has described all the tibiæ as armed with a short spine ; M. Duvivier gives the anterior pair as unarmed. I have failed to discern any tooth on the anterior pair.

Genus NADRANA.

Dr. Chapuis has given an erroneous diagnosis of this genus ; he states that the anterior acetabula are open, the apices of the anterior tibiæ unarmed, and that the basal joint of the metatarsus is only equal in length to the following two united. In all my specimens, including the type, the anterior acetabula are entirely closed, the anterior tibiæ are armed with a distinct spine, and the basal joint of the metatarsus is longer than the following three united.

Beyond the shallow excavation on the disc of the thorax in *Nadrana*, which I look upon as a specific, not generic, character, and a slight difference in the relative lengths of the second and third joints of the antennæ, I do not see any reason for separating *Candezea* (Chap., Ann. Mus. Civ. Gen., xv, p. 24) from the present genus.

Genus OCHRALEA.

Dr. Chapuis, in the *Genera des Coléoptères*, gives the anterior acetabula in *Ochralea* as closed ; I have examined many specimens of *Ochralea flava* (Chapuis' type) as well as of other allied species of the genus, and have found in every instance the acetabula open ; Mr. Jacoby, whom I requested to examine the specimens in his collection, has found them in one solitary instance closed, but in all the rest open. It thus appears that open acetabula are the rule, and closed ones the exception in the present genus, and that *Ochralea* must be removed from the section in which it at present stands, and be placed near *Luperodes*, with which genus it becomes a question as to whether or not it ought to be amalgamated. As our knowledge of the *Galerucina* extends, it will, I think, be found that the open or closed states of the anterior acetabula have not the same primary importance in the arrangement of the family as that assigned to them by Dr. Chapuis ; as seen above, the acetabula in individuals of the same species vary from open to closed, whilst in some genera, *Syoplia*, *Metroidea*, and others, the anterior acetabulum is often closed on one side, and open

on the other in the same individual ; this being the case, it must sometimes occur that, relying on these characters alone, genera are established and closely allied species separated, on insufficient grounds. I draw attention to this to point out that, where practicable, a series of specimens should be examined and any deviation from the typical form be noted. Where the anterior coxae are very prominent and the hinder margin of the acetabulum is very narrow (as frequently occurs), there is often greater difficulty in ascertaining the actual state of the cavity, without either removing the coxae, or detaching the thorax from the rest of the body.

HISPONDONTA PLAGIATA.

Ovata, depressa, cordide flava, nitida, antennis piceis; thorace quam longo dimidio latiori, lateribus rotundatis; disco basi et ad latera distincte punctato; elytris seriatopunctatis, utrisque vix pone medium plaga magna, male definita, picea instructis.

Long., 5 lin.

Hab. : India ; a single specimen in my collection.

Front excavated and coarsely punctured ; vertex smooth, impunctate. Thorax one-half broader than long ; sides rounded, the hinder angle with an obtuse tooth ; disc smooth and nearly impunctate in front, its base, together with the sides, rather coarsely punctured. Elytra much broader than the thorax, rather strongly seriate-punctate.

Closely resembling the pale varieties of *H. janthina*, Bland., separated from that species by the much broader thorax, its sides at the same time being more regularly rounded than in that insect.

OXYCEPHALA WALLACEI.

Elongata, postice vix ampliata, modice convexa, nigra, nitida, elytris flavofulvis, apice late nigro-cyaneis.

Long., 7 lin.

Hab. : Solomon Islands.

Face strongly produced between the eyes, armed just below the antennæ with an obtuse tooth ; antennæ rather less than half the body in length, filiform, slightly compressed towards the apex. Thorax longer than broad ; sides straight and parallel from the base to beyond the middle, then abruptly contracted to the apex ; upper surface sub-cylindrical at the apex, flattened posteriorly, strongly punctured, middle disc deeply foveolate on either side ; extending from the apex nearly to the base, but narrowed posteriorly, is a smooth, impunctate space ; sides within the lateral margin deeply excavated and coarsely punctured. Elytra regularly punctate-striate ; each elytron with four elevated costæ, the third from the suture obsolete on the anterior half of the disc.

The elongate thorax will at once separate the present species from *O. speciosa*, Boisd.

The Butts, Warwick :
March, 1887.

NOTES ON SOME HABITS OF *SPHECODES*, LATR., AND *NOMADA*, FAB.

BY R. C. L. PERKINS.

During the past summer I spent many hours in localities where the genus *Sphecodes* is well represented, both in number of species and of individuals, and, consequently, had excellent opportunities of studying some of their habits.

Towards the end of April (about a fortnight after the re-appearance of *Halictus*) the hibernated and impregnated females appear abroad, and may be met with abundantly until quite the end of June; in fact, old and battered examples are still to be found when the first males begin to emerge.

These females may generally be found flying along hard-trodden pathways and dry banks, especially those which are entirely, or in part, denuded of grass and herbage. They appear indifferent as to the nature of the soil, whether clay, sand, or gravel; possibly, however, some species are found more abundantly on one soil than on another. I have found *S. ferruginatus*, Schenck, *hyalinatus*, Schenck, and *variegatus*, Von Hag., far more abundant on clay than elsewhere. They usually settle on the bare ground, particularly on light-coloured stones, or often on a piece of paper, china, or any other white object, on which, if not approached too closely, they may be watched basking in the hottest sunshine. They run along the ground with speed, much in the manner of a *Pompilus*; they resemble the sand-wasps too, in their habit of exploring every crack and inequality they meet with, and this habit is more especially marked in some of the smaller species of the genus. I should doubt if they ever go far from their breeding-place, but fly up and down just above the surface of the ground in its immediate vicinity.

Of the very numerous spots in which I have observed them breeding, nearly all have been occupied also by a colony of some species of *Halictus*; and, what is still more suggestive, where the *larger* species of *Sphecodes* breed, there will be found a colony of one of the *larger* *Halicti*, and the *smaller* species of the one genus will be found with the *smaller* species of the other. For instance, I take *S. gibbus*, Linn., amongst *H. rubicundus*, Christ, and *S. subquadratus*, Smith, with the same species; *S. dimidiatus*, Von Hag., with *H. nitidiusculus*, Kirb.; *S. affinis*, Von Hag., with *H. tumulorum*, Linn.; but I do not mean to say that the above associations are universal or strictly adhered to, for *S. gibbus* may be found with *H. leucozonius*, Schr.; *S. subquadratus*, Smith, with *H. cylindricus*, Fab.; *S. affinis*, Von Hag., with *H. nitidiusculus*, Kirb., and *H. morio*, Fab.

All round Oxford the stone walls are often covered on the top with mud scraped from the road side. In the mud on one of these a colony of *H. rubicundus*, Christ, was established, occupying a length of a yard or so; in this small space, however, were crowded hundreds of burrows, and amongst the scores of the *Halictus* that were entering these, laden with pollen, now and then a specimen or two of *S. gibbus* would be seen hovering around, or going in amongst them. And yet there were dozens of yards of wall, with mud exactly similar, equally in the sunshine, and quite unoccupied.

This same species (*S. gibbus*) was chief actor in a scene far more interesting. On the 9th of last June, on a hard sandy pathway, I saw a female, as it seemed at first sight, digging a burrow. Soon, however, it appeared to me to be enlarging the opening of one already formed. Its head was hidden in this opening, and with its head in this position it would now and then turn slowly round in a circle. I may here say that I had placed my net over it, and was watching it through this, but it took no notice—probably it was too much occupied otherwise. Presently it retreated backwards an inch from the opening, when, to my surprise, I saw another bee a short way down the burrow. This afterwards proved to be a worn ♀ of *H. leucozonius*. The *Sphecodes* now made a rush down the burrow, and set to work attacking the tail of the *Halictus* with its mandibles. Again the former left the burrow, and was this time followed by the other. But now finding themselves prisoners, their only thought was of escape, so I was unable to see what would have been the end of the struggle.

As to the flowers which these females visit, I have only seen them myself once or twice on the common daisy, and once on the blossom of the whitethorn, but from their love of settling on other white objects (as mentioned above) I am inclined to think that in these instances it was only for the purpose of sunning themselves.

Several of the facts I have mentioned would seem to point to the genus being parasitic on *Halictus*, but the weight of evidence seems in favour of its being non-parasitic. It is difficult to see how the point can be proved, except by rearing them from the burrow, though, possibly, it may have been settled by some Continental Hymenopterist.

As to battles between host and parasite, Shuckard mentions them between *Anthophora* and *Melecta*, and *Colletes* and *Epeolus*; these I have had no chance of seeing, but what is more curious, I have seen two females of the Fosser, *Agenia variegata*, Linn., fight with the utmost fury, the one having entered the other's burrow.

So far, I have been speaking solely of the hibernated females; what follows refers to the brood sprung from these.

About the middle of July the first males appear, and continue on the wing until nearly the end of September. They may be found abundantly on flowers in the vicinity of their breeding-place, but often wander to some distance, so that stragglers may be found in most unlikely places.

They may sometimes be taken by scores off *Carduus arvensis*, various *Umbelliferae*, and *Achillea millefolium*, and less abundantly on *Senecio*, *Crepis*, *Centaurea*, *Rubus*, and many other flowers.

In a few days the fresh females emerge. They are, comparatively speaking, rarely seen on flowers, and, probably, as a rule, retire to their winter quarters almost directly after impregnation. None of the *Bombyces* amongst *Lepidoptera* have greater powers of attraction for the males than these. Often a dozen of the latter may be seen buzzing round some tufts of grass, amongst the roots of which the female will often be found. Nor does the attraction cease even with death. For if a freshly-killed female be placed upon the ground, the males will not be long in finding her out, and this is a sure way of getting the former correctly named, as the latter sex affords much clearer specific characters. Indeed, they are so bold, that one day on turning out some dozen specimens from a killing-bottle into my hand (although at the time I was sitting under a tree, and quite in the shade), a male was attracted, settled on my hand, and walked about over the heap, nor was it frightened away, until I had twice attempted to catch it with my other hand.

There would seem to be some peculiarity with regards to the economy of some of those species of *Nomada*, which are parasitic upon *Halictus*. For whereas *N. Fabriciana*, Linn., *N. flavoguttata*, Kirb., and *N. furva*, Panz., appear in April or May, and are found in June (*i. e.*, are on the wing when the *Halicti* with which they breed are provisioning their nests and depositing their eggs), *N. solidaginis*, Panz., *N. jacobææ*, Panz., and others appear with the fresh brood of *Halictus* in July and August, of which the females hibernate and deposit eggs in the spring. To continue the race it would appear necessary for the females of these *Nomadæ* to follow their example—but do they do so?

With regard to *N. Fabriciana*, Linn., though common, it is an interesting species. Generally, I have found it abundantly infesting colonies of *Halictus rubicundus*, Christ. Mr. Saunders, in his Synopsis, says that, probably it is parasitic on *Andrena Gwynana*, Kirb., and

double-brooded like its host. This I have found to be the case ; the second brood, however, are much less plentiful and darker in colour. I found a few at Oxford, and the only species that appeared with it, that it was likely to infest, was the scarce *Andrena angustior*, Kirb. F. Smith and Shuckard both took it at Hampstead infesting *Panurgus ursinus*, Gmel., one of the *Apidae* ; the latter in fact says that it is restricted to this species.

Sopworth Rectory, Chippenham :
January, 1887.

VARIABLE MOULTING IN *ORGYIA*.

BY PROF. C. V. RILEY, M.A., F.E.S.

Dr. T. A. Chapman's remarks on the moulting of the larva of *Orgyia antiqua* (March number) have just fallen under my notice. It may interest him to know that in 1868 I called attention to the fact that the male larva of *Orgyia leucostigma* undergoes one moult less than the female larva (First Report on the Insects of Missouri). The variation from the normal number of moults (3 for ♂, 4 for ♀), noticed by him in *antiqua*, has also been noticed in *leucostigma* since the publication of the report referred to. As to some of the questions which Dr. Chapman raises, I would say that a pretty extensive experience in rearing larvæ of all Orders leads me to the conclusion that there is a very general tendency in individuals to vary from the normal number of moults in the species ; that whenever there is much discrepancy in the size of the sexes, the smaller (usually the male) undergoes a less number of moults (universal, I believe, in the *Coccidae*), and that the variation in number of larval moults, except where, as in these cases, it is sexual, and presumably predetermined in the egg, is dependent on food-supply rather than hibernation. In frequent-moulting species like *Tenebrio* and *Dermestes*, I have shown by experiment* that there is a relation between scarcity of food (and consequent retardation in development) and increased number of moults, and think it may be stated as a very general rule that moulting is correlated with rate of growth and nutrition, those species which have a short larval existence, generously nourished, exuviating least. A rule applying to the class is presumably applicable to the individual.

Newton, Kans., U. S. A. :
March 21st, 1887.

* See Ann. Rep. U. S. Entomologist for 1885, and Am. Naturalist, about 1883. I write on a Pullman, en route for California, else would give specific references.

OCCURRENCE IN DORSETSHIRE OF *BUTALIS SICCELLA*, ZELLER,
A SPECIES NEW TO BRITAIN.

BY E. R. BANKES, M.A., F.E.S.

I have much pleasure in recording the addition to the British list of this obscure but interesting little *Butalis*, which I was fortunate enough to meet with near Weymouth in the end of June of last year (1886). Not long previously, Mr. C. W. Dale happened to mention that some years ago he had taken *B. variella* in that locality, whereupon, although he had no doubt about the identity of the species, I determined to investigate the matter, for I knew that *Erica cinerea*, upon which we find the larva of *B. variella* in this district, did not grow in the neighbourhood. Accordingly, towards the end of June, I went down, accompanied by Mr. Dale, to search for the insect, and was fortunate in meeting with specimens of a *Butalis*, which struck me at once as being very different from the typical *B. variella*, and which have lately been identified by Mr. H. T. Stainton as *B. siccella*, Zeller.

This species is described by Professor Zeller in the "Linnæa Entomologica," x, 257, and it may be interesting to quote the remarks he there makes about it, as compared with the closely allied *B. variella*.

"Although very variable, this species appears to be specifically distinguished from *variella* by the anal tuft of the male, which is stouter, and has the appearance of being cut off straight behind ('den stärkern, hinten grade abgeschnittenen Afterbusch'). The more obtuse form of the fore-wings, and the blackish upper surface of the abdomen, must also be considered as affording additional points of distinction.

"*Siccella* is, as a rule, smaller than *variella*, yet, especially in the female sex, it does attain to the size of the smallest specimens of the latter.

"Fore-wings shorter than in *variella*, and, owing to the greater density of the fringes, appearing less sharply pointed; the ground-colour darker, yellowish-brown, the white scales being sparingly scattered over the surface: the quantity of these scales varies greatly, but does not cause the ground-colour to appear paler: these scales accumulate at the apex, and here generally form a whitish spot—sometimes, however, they are entirely absent.

"The fold is black; beyond the middle lies a white dot composed of a few scales; between this and the base there is generally another dot, variable in size, and sometimes larger than the former. At the extremity of the fold there are only scattered white scales, which do not form a spot.

"At Glogau *siccella* is not rare in sandy Scotch-fir woods in June. It flies in the sunshine, frequenting flowers, and, in company with *cicadella*, visits those of *Jasione montana*. I have also taken it on the flowers of *Potentilla argentea*."

Von Heinemann considers *B. siccella* as only a variety of *B. variella*; but Snellen, writing at a later date, keeps them separate, and there can be but little doubt that they are really distinct.

B. siccella (alar. exp., $3\frac{1}{2}$ "— $4\frac{1}{2}$ ") may be distinguished from *B. variella* (alar. exp., $4\frac{1}{2}$ "—5") by its smaller size, shorter wings, stouter and darker abdomen, and, so far as my observation goes, by its uniformly darker colour. The specimens which I took are all very dark, and have fewer white scales and light markings than any *variella* I have ever met with; they seem to vary but slightly, whereas in *B. variella* there is every possible variety from very pale grey down to nearly black.

The habits of the two insects are apparently precisely similar, as they both skip along with short jerky flights over the scant herbage or bare sand in the hot sunshine.

I hope to meet with the larva of *B. siccella* shortly, as at the time I took the imago it struck me that *Thymus serpyllum* would very possibly prove to be its food-plant, and this surmise is rather confirmed by the following remarks of Tengström, who writes:—

"The little moth is *Chryseethia siccella*, Zell., a Butalid of which the disproportionately long, pale steel-grey, larva lives in sand-tubes several inches long, both under *Thymus* and under *Empetrum*, and in astonishing multitudes. From the middle of June to the beginning of July one can find everywhere about, where these plants grow on the open loose sand, not only the perfect insects, but also the larvæ and pupæ of this moth in infinite numbers."

I am greatly indebted to Mr. Stainton for his kind help in identifying this species, and also for the above extracts from the works of Zeller and Tengström.

The Rectory, Corfe Castle:
March 18th, 1887.

Notodonta torva, Hüb., in Great Britain.—When recently looking through the collections of Mr. F. Norgate, of Downham, near Brandon (formerly of Sparham), he drew my attention to a moth which he had placed, with doubt, in his series of *Peridea trepida*. This I recognised as *Notodonta torva*, Hüb., and a subsequent comparison with a continental specimen removed all doubt about it. It was reared by Mr. Norgate from either egg or larva found by him in North Norfolk, probably in July or August, 1882; but as the ova found then hatched into what were supposed to be blackish varieties of the larva of *N. ziczac*, no record was kept sufficient to distinguish them from his other *Notodonta* larvæ, which others were all taken also in the same division of Norfolk. He found the supposed eggs of *N. ziczac* on aspen (*Populus tremula*) in July, and on Canadian poplar (*Populus balsamifera*) in August of that year. Both produced very dark larvæ similar in shape to those of *ziczac*, and it was most probably from one of these that *torva* appeared. Unfortunately the pupa was not separated from others of the same locality. He had no larvæ nor pupæ of *Notodonta* from any other locality that year, and is quite certain that this *torva* was reared from an egg or larva of his own taking in Norfolk.

This is one of the finest additions that has been made to the British list for many years. It is not unlike *Peridea trepida* in general appearance, but may at once be separated from it by the generic character of having *hairy eyes*, those of *trepida* being smooth and bright. Its fore-wings are shorter than those of *trepida*, but nearly as broad, of a dull grey with a faint under shade of yellowish. The two transverse lines are of a darker grey, and they *very nearly meet* on the dorsal margin just behind the "prominent" tuft. Between these lines is an indistinct lunule in a paler spot. Hind-wings grey. Antennæ reddish. It is the largest European species in the (restricted) genus *Notodonta*, and is widely distributed in Europe. Its larva feeds in September on aspen (*Populus tremula*), and is scarcely to be distinguished from that of *N. ziczac*. It was formerly placed in the list of reputed British species, but no reliable record of its previous occurrence in this country seems to exist.—CHAS. G. BARRETT, King's Lynn, Norfolk: *April 15th, 1887.*

Aporia crataegi in *England* in the last century.—I find Albin, 1720, has this species in his second plate, without any note of its being a rarity; he also gives a reference to Ray, *Hist. Insect.*, p. 115, n. 5;* its continuance, therefore, in this country has been of some duration, and must have covered many cycles of favourable and unfavourable seasons.

I am inclined to think that when persistent and unlimited "collecting" comes to the aid of bad weather, the chances of the survival of a large day-flying species must be a good deal diminished. The protection of "small birds" must have some influence in such matters.—J. HELLINS; Exeter, *March 31st, 1887.*

Aporia crataegi in *Devonshire*.—As to queries inserted in the last number of *Ent. Mo. Mag.*, respecting *Aporia crataegi*, whether it is indigenous to Devon or not, I have stated in my *Fauna of Devon*, Section *Lepidoptera*, p. 18, exceedingly local and rare, and, so far as I can learn, the only spot known for this species in the west is Moreton Hemstead. In an annotated copy of Turton and Kingston's *Natural History* of the District, in the hand writing of its late owner, R. T. Abrahams, Esq., it is stated, "taken by Mr. Williams near Moreton Hemstead." This must have been at least forty years ago. I have myself been a collector of all orders of insects in Devon since the year 1849, and not a single specimen has fallen under my observation during this time, neither have I heard of one being taken in any part of the county. From this I infer that this species is not indigenous in Devon, but that it is an immigrant from the continent.—EDWARD PARFITT, Exeter: *April 4th, 1887.*

Pedigree Moth-breeding.—Touching the interesting experiments suggested by Mr. Galton, and the views expressed on p. 238 of the March (1887) number, I would second Mr. McLachlan's recommendation of the common *Sericaria mori*. It has

[*] Ray's *Historia Insectorum*, a posthumous work, published in 1710, only enumerates the insect, without saying whether common or otherwise, nor does it give any localities. Moses Harris, in his *Aurelian*, published in 1766, says of this insect: "They fly in meadows near corn-fields, and, as they do not fly very fast, are easily taken in your net." He mentions no localities, but after describing the habits of the larva he says, when they are nearly full-fed: "Now is the best time to take them, they being easily seen on account of their size, as they lie on the web together, which they do not forsake till they go in search of a convenient place for their change." So that even in those days the gregarious larva and the slow-flying butterflies were only likely to fall too easy a prey to the picture-making collectors of insects.—Eps. *Digitized by Google*

already produced a large number of well marked races, the crossing of which will facilitate the experiments, while its domestic habits, and the ease with which its feeding and reproduction are controlled, rank it above all other insects for this purpose. Moreover, it shows a convenient tendency to vary under new conditions; for I have never conducted an *education* without noticing individual variation from the typical characteristics, whether as to colour of larva, cocoon or imago, or whether as to number of annual generations. The tendency from monogonism to bigonism, or (to borrow the French terms) from *annuels* to *bivoltins*, is, in fact, quite annoying in the States south of 38°. Yet, in the past sixteen years, I have, by selection, been able to sufficiently fix the characters of a *Maculra*-fed strain (originally a cross between a French yellow and a Japanese white) that it is quite at home on its new food-plant, and shows little tendency to vary in the character of the cocoon.—C. V. RILEY, Topeka, Kans. U. S. A.: *March 21st, 1887.*

Obituary.

John Sang was born at Darlington, on the 3rd March, 1828. As a boy at school he bore an excellent character, and as a reward for a feat of memory in reciting a small English History, he was taught French, and afterwards Latin, free. His knowledge of these languages, thus early acquired, proved afterwards of the greatest use to him in his pursuit of his favourite study, Entomology, and later in life he learnt German in order to extend his knowledge. In his boyhood he was very fond of drawing and painting birds and insects, some of his earliest paintings showing great skill. In 1843 he was apprenticed to a draper at Wakefield, where the seeds of his love of music and entomology were sown. He used frequently to speak of the great delight he experienced in seeing the collection and grounds of the late Charles Waterton. It was during the six years he spent at Wakefield that he commenced collecting butterflies, and here in 1848 he had the gratification of capturing a specimen of *Charocampa celerio*. In 1849 he removed to Manchester, and there began the more thorough and scientific pursuit of Entomology, and formed the nucleus of what was destined to become a very extensive collection. After leaving Manchester he returned to Darlington, succeeding to his father's business in High Row. His earliest communication to any of the Magazines seems to have been that sent to the *Zoologist*, June 23rd, 1853 (Zool., 1853, p. 4001), on the occurrence of *Psecadia funerella* at Richmond, Yorkshire, and *Hypercallia Christiernana* at Castle Eden. His next notice appeared four years later in the *Entomologists' Weekly Intelligencer* (II, 75), on the occurrence of *Lithocletis vacciniella* at Harrogate, and thenceforward his published notices were numerous. He was one of the first captors, in this country, of *Miana expolita*, Doubleday (now referred to *captiuncula* of Treitschke). In 1860 he took a new *Gelechia*, *intaminatella*, which, in 1866, he bred from *Lotus corniculatus*. From the same plant he also bred, in 1866, *Gelechia Sangiella*, a new species which had been named after him, he having first captured it in 1862 on the railway bank near Darlington. Another new *Gelechia* captured by him in salt marshes near Redcar was described in October, 1885, under the name *tetragonella*. He had retired from business, and was employed pretty constantly with Entomology in one way or other, having commenced to depict with care and accuracy the various species in his collection—not being deterred

from attacking in this way even the smallest *Nepticula*; when an event occurred, which changed the even tenor of his life. He had become security for a friend, and owing to the friend's failure, he had to raise a large sum in cash; to do this there was no alternative but to part, amongst other things, with his collection, which was sold in June, 1882. His perfect equanimity during that trying period was so remarkable that it must of necessity, in any notice of him, be mentioned with the greatest respect. Not in any way did he betray that he felt himself a sufferer. He had thought of resuming business in a subordinate capacity, but his entomological talents were too great and too highly appreciated to admit of their being thus lost to science. And in the occupation of Curator of an extensive private collection (Dr. Mason's), and delineator of insects, he passed the remainder of his days. His botanical knowledge was very extensive, and he had a great taste for music, officiating for many years as an Honorary Organist, and he was one of the originators, and for 19 years the Secretary, of the Darlington Choral Society. John Sang was never married. A notice of his sudden death, and its cause, appeared in our last No. (p. 261).

THE SOUTH LONDON ENTOMOLOGICAL AND NATURAL HISTORY SOCIETY:
March 24th, 1887.—R. ADKIN, Esq., F.E.S., President, in the Chair.

Messrs. J. Stringer and J. W. Slater were elected Members.

Mr. J. A. Cooper exhibited a variety of *Cidaria immanata*, Haw., from North Devon. Mr. Carrington remarked that this form was found not uncommonly in the mountains of Scotland, and he believed the larvæ fed on bilberry. Mr. Cooper also showed a specimen of an ichneumon bred from a pupa of *Sesia sphegiformis*, Fb. Mr. T. R. Billups exhibited *Stilpnus deplanatus*, Gr., bred from the larva case of a species of *Psyche* found on a fence in his garden at Peckham, also *Apanteles tetricus*, Reinh., bred from the common thrift (*Armeria maritima*, auct.), found in the Warren, Folkestone.

At the close of the ordinary business, there was an Exhibition of Microscopical Objects. Mr. Tutt showing wings of *Lepidoptera*, prepared and mounted by Mr. Coverdale and himself; Mr. W. West, of Streatham, eyes of spider, &c.; Mr. Dadswell, botanical objects; Mr. Macer, *Vespa vulgaris*, &c.; and Mr. Medland, proboscis of blow fly, &c.

April 14th, 1887.—The President in the Chair.

Mr. J. A. Cooper exhibited bred specimens of *Amphidasya strataria*, Hufn. Mr. C. A. Briggs, a large number of *Lycæna bellargus*, Rott., including many forms both of the male and female dwarfed forms, and some remarkable varieties of the under-side; also another box containing a pale yellow variety of *L. Ægon*, L., and varieties of the under-side of *L. Icarus*, Rott., and *L. Astrarche*, Bgstr. Mr. Adkin, larvæ cases of the Tortrix *Eupæcilia ambiguella*, Hb. Mr. Billups exhibited the following Coleoptera: *Megalosoma typhon* from Chili, *Xylotrupes Gideon* from the West Indies, *X. dichotomus* from the Phillipine Islands, *Golofa centaurea* from West Africa, *G. hastatus* from Mexico, and *G. alacus* from Columbia; also three specimens of the rare Lamellicorn, *Phænus imperator*, Fab., from Chili, and contributed remarks. Mr. Goldthwaite showed living larvæ of *Pericallia syringaria*, L. The Secretary read a letter from Mr. W. F. de V. Kane in respect of a sound-producing Lepidopteron which a friend had taken in the Gerakhpur Woods, India. Mr. T. D. A. Cockerell read a paper on "Variation."—H. W. BARKEE, Hon. Sec.

ENTOMOLOGICAL SOCIETY OF LONDON: April 6th, 1887.—Dr. DAVID SHARP, F.Z.S., President, in the Chair.

Mr. Francis Galton, M.A., F.R.S., of 42, Rutland Gate, S.W.; Mr. John Henry Leech, B.A., F.L.S., of 10, Hyde Park Terrace, W.; and Mr. George S. Parkinson, of Percy Cross, Fulham, S.W.; were elected Fellows.

Mr. Samuel Stevens exhibited specimens of *Arctia mendica*, collected in Co. Cork, by Mr. McDowall, of Manchester. The peculiarity of the Cork form is that the majority of the males are as white as the female of the English form.

Mr. McLachlan exhibited a zinc box used by anglers for the purpose of keeping living flies in, which he thought might be adapted to practical entomological use in the field.

Mr. George T. Porritt exhibited a large number of specimens of *Hybernia progemmaria*, bred from moths collected at Huddersfield last spring. All the females and a large proportion of the males were of the dark variety *fusca*, which, formerly, was almost unknown in Yorkshire, but which now seemed likely to replace the paler and original type. Mr. Jenner Weir and Lord Walsingham both remarked that the number of melanistic forms appeared to be on the increase in the north.

Mr. Gervase F. Mathew, R.N., exhibited several new species of *Rhopalocera* taken by him in the Solomon Islands, during the cruise of H.M.S. "Esquiegle" in 1882 and 1883.

Mr. E. B. Poulton exhibited a large and hairy Lepidopterous larva—apparently of a *Bombyx*—brought from Celebes by Dr. Hickson, and made remarks on the urticating properties of the hairs of the species. Lord Walsingham, Mr. McLachlan, Dr. F. A. Dixey, Mr. Jenner Weir, Dr. Sharp, Dr. Slater, and Mr. Poulton took part in a discussion as to whether urtication was due to the mechanical action of the hairs, or to the presence of formic acid, or some other irritant poison, in glands at the base of the hairs. There appeared to be no doubt that in some species the irritation was merely due to mechanical action.

Mr. P. Crowley exhibited a collection of *Lepidoptera* recently received from West Africa.

Mr. H. Goss announced the capture by Mr. G. D. Tait, at Oporto, in September last, of a specimen of *Anosia Plexippus*, and remarked that only two specimens had been previously recorded from the Continent of Europe.

Lord Walsingham read a paper entitled "A Revision of the Genera *Acrolophus*, Poey, and *Anaphora*, Clem.;" and he exhibited about twenty new species of these and allied genera. The paper was discussed by Mr. Stainton, Mr. McLachlan, Mr. Champion, and Dr. Sharp.

Mr. Poulton read "Notes in 1886 on Lepidopterous Larvæ, &c." In the discussion which ensued, Lord Walsingham referred to instances of protective resemblance in larvæ, and alluded to the existence in certain species, especially of the genus *Melitæa*, of prothoracic glands. Further instances of protective resemblance were cited by Mr. Jenner Weir. Dr. F. A. Dixey remarked on the extraordinary powers of contraction which appeared to be possessed by the retractor muscle of the flagellum in *D. tinsla*. The discussion was continued by Mr. Gervase Mathew, Mr. W. White, Dr. Sharp, Mr. Porritt, and others.—H. Goss, Hon. Secretary.

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